

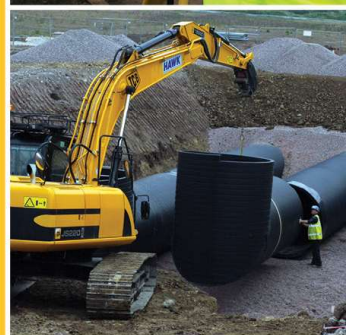
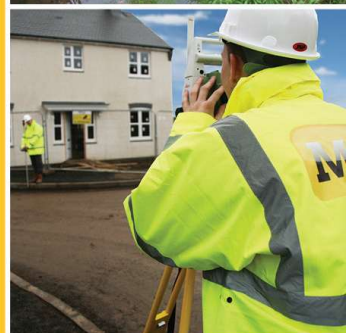


**PROPOSED RESIDENTIAL DEVELOPMENT,  
CHEQUERSFIELD,  
WELWYN GARDEN CITY**

**NOISE ASSESSMENT**

**MAY 2018**

**REPORT REF: 22573/05-18/5014**



**PROPOSED RESIDENTIAL DEVELOPMENT,  
CHEQUERSFIELD,  
WELWYN GARDEN CITY**

**NOISE ASSESSMENT**

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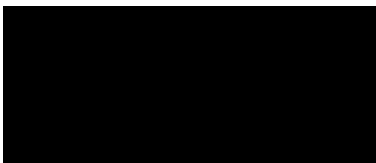
**REPORT REF: 22573/05-18/5014**

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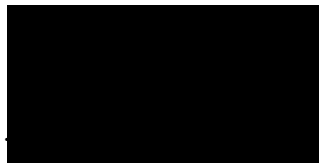
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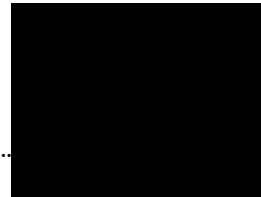
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BSc AMIOA

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## **1.0 INTRODUCTION**

### **General**

- 1.1 Mewies Engineering Consultants Ltd (M-EC), has been commissioned by Taylor Wimpey (North Thames), to undertake a Noise Assessment for a proposed residential development, at land off Chequersfield, Welwyn Garden City. A site location plan is provided in Appendix A.

### **Assessment Scope**

- 1.2 The scoping methodology of this Noise Assessment has been sent to the relevant officer at Welwyn Hatfield Borough Council (WHBC).
- 1.3 The proposed site is bound by Chequersfield to the south and east, with the rail line situated to the west. This noise assessment seeks to establish existing sound levels at the proposed site and where necessary provide recommendations for mitigation to reduce sound levels.
- 1.4 Assessment of noise impact upon future receptors, at the proposed development, has been undertaken with reference to BS8233:2014 'Guidance on sound insulation and noise reduction for buildings', World Health Organisation 'Guidelines for Community Noise' 1999,
- 1.5 M-EC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from M-EC.
- 1.6 M-EC accepts no responsibility or liability for:
- a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
  - b) The issue of this document to any third party with whom approval for use has not been agreed.

## **2.0 SITE DESCRIPTION**

### **Existing Site**

2.1 The existing site is currently arable land, located approximately 1.9km south from Welwyn Garden City town centre. The south of the site is bound by Chequersfield, with dwellings and flats that have recently been constructed as part of a separate application. The north, east and west of the site are bound by arable land. Beyond the immediate boundaries, a railway track lies to the west of the site. An industrial estate is located to the north, and Chequers (A1000) is located to the east, providing access to the town centre.

2.2 A site location plan is provided in Appendix A.

### **Development Proposals**

2.3 The proposed development is for the construction of 30 flats, which will be split across two blocks, with 12 flats provided in Block A, and 27 flats provided in Block B.

2.4 The proposed site layout is contained within Appendix B.

### **3.0 POLICY AND GUIDANCE**

3.1 This section of the report outlines the legislative and policy context of the proposed development with respect to noise

#### **National Planning Policy Framework and Planning Practice Guidance**

3.2 The NPPF, published in March 2012, sets out the Government’s planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

3.3 Paragraph 123 of the NPPF advises that, with respect to noise emissions, 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 to a minimum other adverse impact on health and quality of life arising from noise from new development, including through the use of conditions;

3.4 Planning Practice Guidance, published in March 2014, advises on how planning can manage potential noise impacts in new development. The guidance states that noise needs to be considered when... *“new developments would be sensitive to the prevailing acoustic environment.”* Although noise can override other planning concerns, *“neither the NPSE<sup>1</sup> nor the NPPF expects noise to be considered in isolation from the economic, social and other environmental dimensions of the proposed development.”*

3.5 When making decisions, local planning authorities should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

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<sup>1</sup> Noise Policy Statement for England 2010

3.6 In line with the Explanatory Note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level. The guidance points to the Explanatory Note for Noise Policy Statement for England 2010 for further information.

**Noise Policy Statement for England 2010**

3.7 The NPSE sets out the long term vision of Government noise policy. The Noise Policy Vision is supported by the following Noise Policy Aims:

1. Avoid significant impacts on health and quality of life;
2. Mitigate and minimise adverse effects on health and quality of life; and
3. Where possible, contribute to the improvement of health and quality of life.

3.8 The NPSE categorises noise exposure through the concept of observed effect levels:

- No Observed Effect Level (NOEL): The level below which no effect can be detected.
- Lowest Observed Adverse Effect Level (LOAEL): the level above which adverse effects on health and quality of life can be detected.
- Significant Observed Adverse Effect Level (SOAEL): the level of noise exposure above which significant adverse effects on health and quality of life occur.

3.9 The second Noise Policy Aim refers to the situation where the noise impact lies between the LOAEL and the SOAEL. It requires that, *“all reasonable steps should be taken to mitigate and minimise effects on health and quality of life... This does not mean that such adverse effects cannot occur.”*

3.10 The NPSE does not contain specific noise level limits to define the SOAEL as it is likely to be different for different noise sources and parameters. In the absence of national LOAEL and SOAEL noise level criteria, noise levels have been assessed against criteria contained within BS8233:2014 and WHO Guidelines.

### The World Health Organisation Guidelines

- 3.11 The WHO Guidelines for Community Noise 1999 consolidate scientific knowledge on the health impacts of community noise and provide guidance to protect people from the harmful effects of noise in non-industrial environments.
- 3.12 The WHO Guidelines for Community Noise set out health-based guideline values for community noise, including recommended noise level values for the onset of sleep disturbance, annoyance and speech interference for the general population. Guideline values are provided for outdoor living areas, living rooms and bedrooms, for both continuous noise and discrete noise events. These are:
- The  $L_{Aeq,T}$ - the A-weighted equivalent continuous noise energy level over a given period of time T, applied to fluctuating noise levels to give single figure descriptor and sometimes referred to as the 'average'; and
  - The  $L_{AFmax}$ - the maximum A-weighted noise instantaneous sound pressure level recorded during a measurement period using a fast time response.
- 3.13 With regard to outdoor living areas the WHO Guidelines for Community Noise state that, *'to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB(A)  $L_{Aeq}$  on balconies, terraces, and in outdoor living areas'*.

**Table 1: WHO Guideline Values for Community Noise**

Specific Environment	Critical Health Effect (s)	$L_{Aeq}$ dB(A)	Time base (hours)	$L_{AFmax}$ fast dB(A)
Outdoor living area	Serious annoyance, daytime and evening.	55	16	-
	Moderate annoyance, daytime and evening.	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedroom	Sleep disturbance night-time	30	8	45
Outside bedroom	Sleep disturbance, window open (outdoor values)	45	8	60

Source: World Health Organisation 1999



**BS8233:2014**

3.14 BS8233:2014 contains suggested criteria for common situations, such as resting and sleeping, and proposes noise levels that normally satisfy those criteria for most people. For dwellings, the main considerations are:

- For bedrooms, the acoustic effect on sleep; and,
- For other rooms, the acoustic effect on resting, listening and communicating.

3.15 Suggested noise levels reflect those contained within the WHO Guidelines. BS8233:2014 advises that the time period  $T$ , should be appropriate for the activity involved, in this case the daytime  $L_{Aeq,16hr}$  (07:00-23:00) and night-time  $L_{Aeq,8hr}$  (23:00-07:00). Table 2 below details guideline values for dwellings as recommended within BS8233:2014.

**Table 2: BS8233:2014 Recommended Noise Levels**

Criterion	Typical situations	Time	
		Daytime 07:00 to 23:00	Night-time 23:00 to 07:00
Resting	Living room	35	-
Dining	Dining room/ area	40	-
Sleeping (daytime resting)	Bedroom	35	30

Source: BS8233:2014

3.16 With regard to external noise levels in amenity spaces such as gardens, the guidance advises that, *“it is desirable that the external noise level does not exceed 55dB  $L_{Aeq,T}$ , which would be acceptable in noisier environments. However it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.”*

## **4.0 METHODOLOGY**

- 4.1 Existing sound levels at the site have been established by undertaking a period of on-site noise survey

### **Noise Survey Programme**

- 4.2 The noise survey was undertaken at one location; parallel to the rail line, in the centre of the site's western boundary, for a continuous 3-hour period, between 10:26am on 8<sup>th</sup> June 2017 and 12:26pm 8<sup>th</sup> June 2017.

- 4.3 A noise survey location plan is included in Appendix C.

### **Noise Monitoring Equipment**

- 4.4  $L_{Aeq,T}$  and  $L_{AFmax}$  noise levels were recorded using a Type 1 Norsonic 140 Sound Analyser (serial number 1406248). Measurements were A-weighted and recorded using a fast time response.

- 4.5 The sound level meter was calibrated using a Norsonic Type 1251 Sound Calibrator (serial number 34315) at the start and finish of each monitoring period. No significant calibration drifts were observed.

- 4.6 The sound level meter was set at a height of approximately 1.5m above the ground in a free field position. The noise meter was left in-situ for the monitoring periods described above. The sound level meter was set to log every 1 second.

### **Meteorological Conditions**

- 4.7 Weather conditions were warm and clear, with no precipitation.

### **Observations**

- 4.8 Trains using the rail line were the most noted sound source though bird song and pedestrians walking, including talking and dogs barking was noticeably more audible. Also noteworthy was the sound of a helicopter at 10:47am.

## 5.0 RESULTS

5.1 Measured sound levels are set out below. Assessment of results has been undertaken in the context of the proposed dwellings as shown on the site layout shown in Appendix B.

### Results

5.2 A summary of measured sound levels at Location 1, approximately 30m from the edge the rail line, are shown in Table 6 below.

**Table 3: Location 1 Measured Sound Levels**

Date	Time	$L_{AF(max)}$ (dB)	$L_{Aeq,T}$ (dB)
8 <sup>th</sup> June 2017	10:26	83	55
	11:26	74	54
	12:26	72	54

5.3 The results in Table 3 indicate that the measured  $L_{Aeq,1hour}$  sound levels show little significant variance. The highest  $L_{Aeq,1hour}$  sound level was obtained between 10:26 and 11:26; however, this was due to pedestrian movements along the footpath, which included talking and dogs barking, and was not related to the rail line in any way. These events are considered to be transient in nature, and should not be used for any form of assessment.

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## 6.0 ASSESSMENT

6.1 As discussed in Section 3, BS8233:2014 and WHO Guidelines provide recommended noise level limits for living rooms and bedrooms. A summary of noise level criteria is provided below:

- a. Living rooms (daytime)  $L_{Aeq,16hour}$  35dB(A);
- b. Bedrooms(daytime)  $L_{Aeq,16hour}$  35dB(A);
- c. Bedrooms(night-time)  $L_{Aeq,16hour}$  30dB(A);
- d. Bedrooms (night-time)  $L_{AFmax}$  45dB(A); and
- e. Outdoor living areas  $L_{Aeq,16hour}$  50dB(A) lower limit and 55 dB(A) upper limit.

### External Sound Levels

6.2 The results in Table 3 show that, during the hours of the noise survey, the highest measured  $L_{Aeq,T}$  sound level was 55dB(A).

6.3 It should be noted that the proposed dwellings consist of typical apartments, with no gardens or external living areas proposed. In addition, there are no proposed balconies at the site, so mitigation to meet the given external sound level criteria will not be required.

### Internal sound levels

6.4 With regard to sound levels in living rooms and bedrooms during the daytime, for proposed dwellings, the existing  $L_{Aeq,T}$  of 55.0dB(A) is up to 20dB(A) above the recommended value of 35dB(A) for living and bedrooms during the daytime. The  $L_{Aeq,16hour}$  has been determined using the highest measured sound level.

6.5 The expected night-time  $L_{AFmax}$  level of approximately 81dB(A) is 36dB above the recommended value of 45dB(A).

### Railway Noise Levels

6.7 Given that the measured noise levels at the site show little to no variance, in order to isolate the specific noise level of a train pass-by, the measured 1 second data was analysed. However, upon interrogation, it was found that it was not possible to differentiate the individual train pass-bys from the overall dataset, despite having noted the times of each train witnessed whilst on-site.

6.8 It should be noted at this stage that only passenger trains were witnessed passing the site. Notwithstanding this, it is understood that freight traffic also uses this section of

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the line. The Network Rail Working timetable indicates that there are several freight train movements past the site.

- 6.9 As freight trains typically represent the worst-case for noise levels from railway lines, in order to provide an indication as to the sort of typical  $L_{Amax}$  sound level that could be experienced at the nearest proposed dwellings, data gathered for a similar project undertaken by M-EC (for a proposed site at Pershore Road, Eckington, located adjacent to the Birmingham to Bristol rail line) has been utilised. The Network Rail Working Timetable indicates that the freight trains that run along this track are Class 66 locomotives, the same as at the site in question.
- 6.10 Scheduled time slots vary for each day of the week, with a maximum of five during the daytime period on Thursdays, and a maximum of two during the night-time period on Saturdays. However, although a particular train is booked in to use a particular time slot on the track, the operator can choose not to utilise said time slot. They will only run when required, or to and from terminals/yards as determined by traffic demand and network logistics.
- 6.11 It is noted that the Network Rail Working Timetable (Section CY 19) indicates that the largest majority of freight trains using the rail line are Class 66 locomotives, with a speed limit of 60mph, although the type and number of wagons is unknown (sound levels will vary according to speed, wagon type and number, track and engine condition etc). However, as mentioned previously, during the survey period, no freight trains were witnessed passing the site in either direction.
- 6.12  $L_{Amax}$  levels of typical Class 66 locomotives, measured at 15m from the Birmingham to Bristol rail line were approximately 90dB(A). There is no reason to suggest that the levels at a similar distance from the rail line in this instance would be anything other than the same. Taking into account distance attenuation to the nearest dwellings at the proposed site, the measured  $L_{Amax}$  level of 90 dB(A) has been corrected using the following formula:

$$L_{Aeq,T} = 10\log(R1/R2) \text{ dB(A)}$$

Where      R1 = distance from nearest railhead to survey location  
              R2 = distance from nearest railhead to nearest residential façade

- 6.14 Calculation indicates that the distance from the survey location to the nearest proposed dwelling would provide approximately 8dB(A) sound attenuation, leading to a  $L_{Amax}$  level of approximately 81dB(A).
- 6.15 The latest layout in our possession indicates that the closest residential façade is gable-end on to the railway. However, this fact does not alter the potential typical  $L_{Amax}$  level, as there is no reduction for a 180° angle of view to a line source, which a railway line is. Therefore, the typical  $L_{Amax}$  at the nearest window would still be approximately 81 dB(A).

**Summary**

- 6.16 Assessment of measured and calculated sound levels against BS8233:2014 and WHO Guideline values indicates that existing sounds levels at the site currently exceed the recommended internal sound levels for new dwellings.
- 6.17 Mitigation is discussed further in Section 7.0 below.

## 7.0 MITIGATION

7.1 Assessment indicates that to achieve acceptable sound levels internally, mitigation will be required at certain locations.

7.2 The following mitigation measures are recommended to be considered within the layout design:

- Selection of glazing, acoustically attenuated ventilation and building fabric with a sufficient sound reduction index –  $R_w$ .

### Internal Noise Levels

7.3 The results indicate that, without mitigation, sound levels above the recommended values are likely to be experienced in living rooms and bedrooms. As windows are usually the acoustically weakest point in a façade, requisite sound reduction to be provided by glazing and ventilation systems to achieve the guideline values have been considered.

7.4 From the temporal site measurement data, it may be extrapolated that, in order to achieve the given BS8233: 2014 internal noise criteria, the building fabric of those façades closest to the railway line, would need to provide a composite sound reduction of the order of ~20 dB(A) during the daytime, and ~27 dB(A) during the night-time.

7.5 Should it be required that the glazing specification be able to attenuate the calculated typical  $L_{Amax}$  levels during the night-time, the composite sound reduction of the façade would need to increase to ~36 dB(A).

7.6 Standard thermal double glazing (4-12-4mm or similar) is capable of providing up to 29dB  $R_w$ . Therefore, it is considered that the installation of standard thermal double glazing will reduce daytime  $L_{Aeq,T}$  noise levels to within the recommended criteria.

7.7 However, should the  $L_{Amax}$  levels require attenuating, it can be seen that standard thermal double glazing will not provide enough attenuation. Therefore, should this situation be the LPA's preferred course, glazing with a composite sound reduction of ~36dB  $R_w$  would be required. This level of attenuation can be provided by glazing with the configuration 10/12/6 – 10mm float pane/12mm cavity/6mm float pane.

- 7.8 The above ratings should be achieved from the glazing system as a whole and include all framing and furniture. As the sound reduction performance of glazing systems can vary from manufacturer to manufacturer, the actual sound reduction performance of the glazing system should be confirmed with the glazing system supplier.
- 7.9 Background ventilation must be provided in accordance with the Building Regulations Approved Document F. To achieve this, window mounted trickle vents or through-wall ventilators that are acoustically attenuated to provide equivalent sound reduction to the glazing may be installed ( $D_{n,e,w}$ , generally approximately 7dB above the required  $R_w$ ) where necessary.
- 7.10 It is important to note that the sound insulation performance of the external building fabric must be at least that of any specified glazing and ventilation system.

**Summary**

- 7.11 It is considered that, with the provision of suitably attenuated glazing and ventilation systems, noise levels at proposed dwellings can be reduced sufficiently to achieve recommended internal sound levels.



## **8.0 SUMMARY AND CONCLUSIONS**

- 8.1 Mewies Engineering Consultants Ltd (M-EC) has been commissioned by Taylor Wimpey (North Thames) to undertake a Noise Assessment for a proposed residential development, at land off Chequersfield, Welwyn Garden City.
- 8.2 The proposed site is bound by Chequersfield to the south and east, with the rail line situated to the west. This noise assessment seeks to establish existing sound levels at the proposed site and where necessary provide recommendations for mitigation to reduce sound levels.
- 8.3 Assessment of sound levels at the proposed development has been undertaken with reference to BS8233:2014 'Guidance on sound insulation and noise reduction for buildings' and World Health Organisation 'Guidelines for Community Noise' 1999.
- 8.4 To establish existing sound levels in the area of the site adjacent to the railway line, noise survey has been undertaken at the western site boundary.
- 8.5 Noise survey results and assessment indicate that mitigation will be required to achieve recommended internal noise levels at some proposed dwellings.
- 8.6 A combination of glazing with the requisite level of sound attenuation, and acoustically attenuated natural ventilation systems, is recommended to reduce noise levels sufficiently. It is considered that with the implementation of this mitigation, the guideline values can be readily achieved in habitable rooms and outdoor living areas.

**APPENDIX A**

M-EC  
The Colmore Building  
20 Colmore Circus Queensway  
Birmingham  
B4 6AT



## SITE LOCATION PLAN

**Project:** Chequersfield, Welwyn Garden City

**File Ref:** 22573

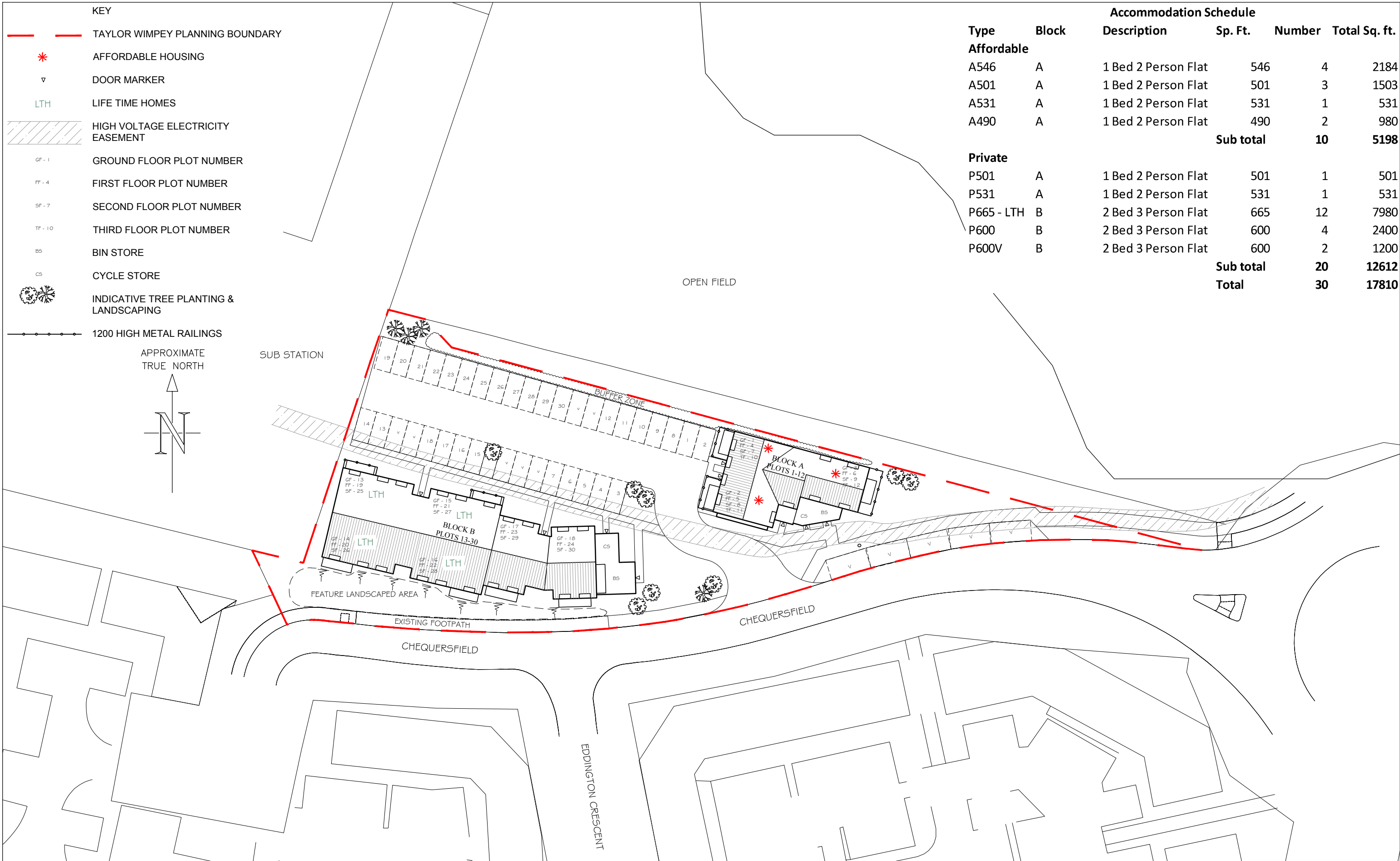
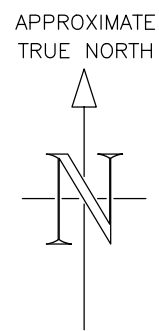
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**Postcode:** AL7 4TX

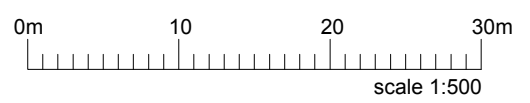


**APPENDIX B**

- KEY**
- TAYLOR WIMPEY PLANNING BOUNDARY
  - \* AFFORDABLE HOUSING
  - ▽ DOOR MARKER
  - LTH LIFE TIME HOMES
  - HIGH VOLTAGE ELECTRICITY EASEMENT
  - GF - 1 GROUND FLOOR PLOT NUMBER
  - FF - 4 FIRST FLOOR PLOT NUMBER
  - SF - 7 SECOND FLOOR PLOT NUMBER
  - TF - 10 THIRD FLOOR PLOT NUMBER
  - BS BIN STORE
  - CS CYCLE STORE
  - INDICATIVE TREE PLANTING & LANDSCAPING
  - 1200 HIGH METAL RAILINGS

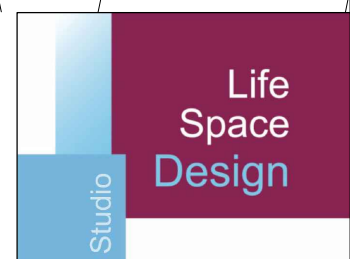


		Accommodation Schedule			
Type	Block	Description	Sp. Ft.	Number	Total Sq. ft.
<b>Affordable</b>					
A546	A	1 Bed 2 Person Flat	546	4	2184
A501	A	1 Bed 2 Person Flat	501	3	1503
A531	A	1 Bed 2 Person Flat	531	1	531
A490	A	1 Bed 2 Person Flat	490	2	980
<b>Sub total</b>				<b>10</b>	<b>5198</b>
<b>Private</b>					
P501	A	1 Bed 2 Person Flat	501	1	501
P531	A	1 Bed 2 Person Flat	531	1	531
P665 - LTH	B	2 Bed 3 Person Flat	665	12	7980
P600	B	2 Bed 3 Person Flat	600	4	2400
P600V	B	2 Bed 3 Person Flat	600	2	1200
<b>Sub total</b>				<b>20</b>	<b>12612</b>
<b>Total</b>				<b>30</b>	<b>17810</b>



LAND NORTH OF CHEQUERSFIELD, WELWYN GARDEN CITY - SITE PLAN (1:500 A3)  
 Dwg No: LSD209-01 B

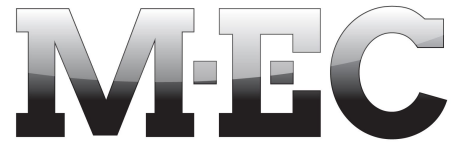
Rev A: Footpath extended. Position of visitor spaces amended to be within ownership.  
 Rev B: Bin store to block A amended. Amenity areas to ground floor plots indicated. Footpath to block A amended following comments from RPS.  
 Easement amended to 3m as recommended by UK Power Network.



**APPENDIX C**



M-EC  
The Colmore Building  
20 Colmore Circus Queensway  
Birmingham  
B4 6AT



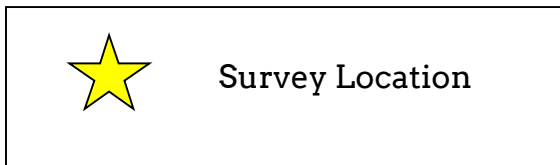
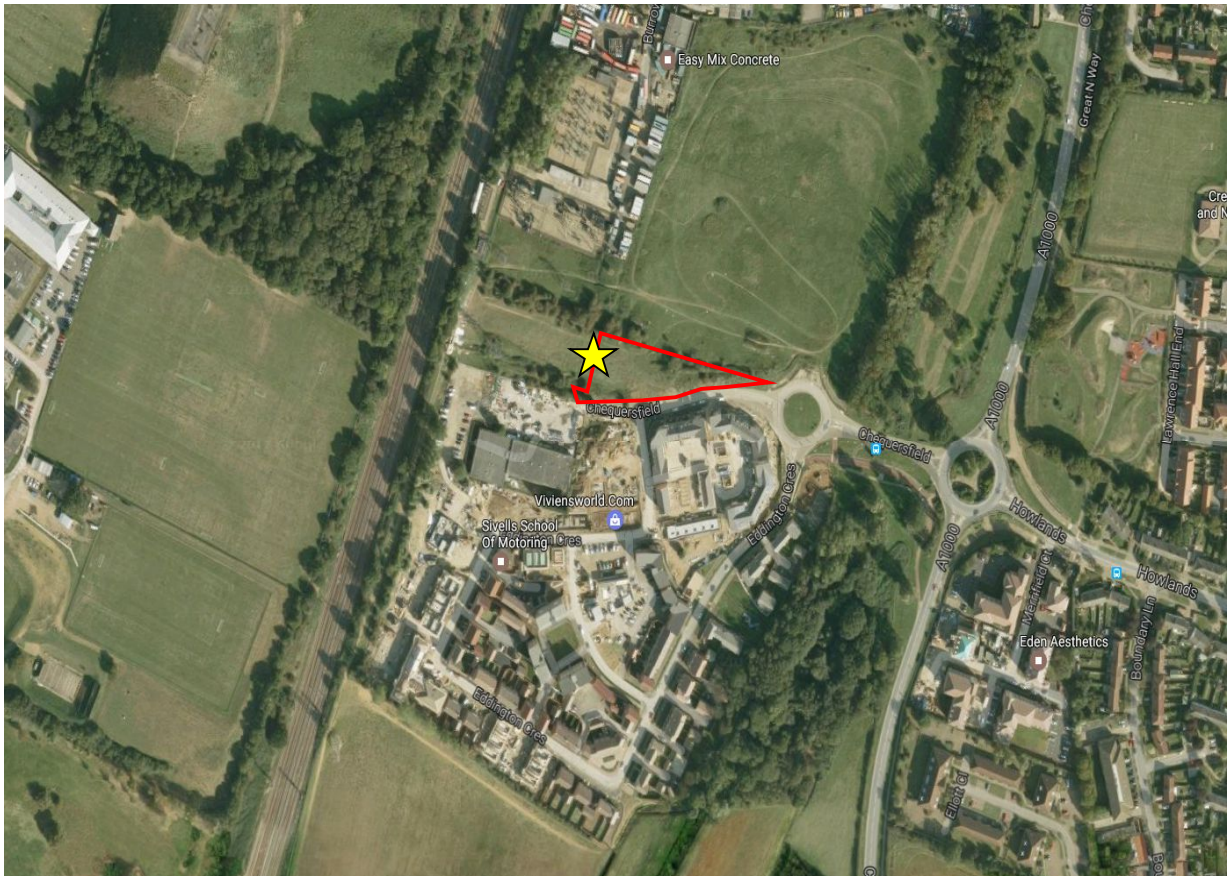
## SURVEY LOCATION PLAN

**Project:** Chequersfield, Welwyn Garden City

**File Ref:** 22573

**O.S. Grid Ref:** 523630, 211306

**Postcode:** AL7 4TX



Civil Engineering

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Drainage

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Flood Risk

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Transport

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Highways

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Structures

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Geotechnics

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Contamination

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Sustainability

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Noise & Air Quality

---

Utilities

---

Geomatics

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Nottingham  
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