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**Land at Woodbine Cottage,
Doncaster Road, Billingley**

Noise Assessment for Residential Development

Report Prepared by:

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Appendix A: Site Proposal/Location Plan

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1.0 Executive Summary

- 1.1 Sharps Gayler LLP (SGL) have been instructed to provide an acoustic assessment relating to a proposed development on land at Woodbine Cottage, Doncaster Road, Billingley.
- 1.2 An assessment of the likely effect of the existing noise environment on future residents has been undertaken, relating to noise from road traffic on the nearby A635 Doncaster Road.
- 1.3 The assessment has been undertaken by reference to noise modelling using traffic data and the UK "Calculation of Road Traffic Noise" methodology.
- 1.4 The assessment has been based on advice in BS8233:2014, in conjunction with the World Health Organisation Guidelines.
- 1.5 The conclusions of the assessment are that the noise environment is such that the development can proceed in a way which provides an acceptable noise climate for future residents, subject to appropriate design and noise mitigation measures.

2.0 Introduction

- 2.1 Sharps Gayler LLP (SGL) has been commissioned to provide an acoustic assessment relating to a proposed development comprising of a single residential dwelling on land adjacent to “Woodbine Cottage”, Doncaster Road, Billingley. A noise assessment is required to take account of the road traffic noise affecting the site from the nearby A635 Doncaster Road. This report will assess the noise climate and any requirements for mitigation measures for the proposed residential dwelling.
- 2.2 The proposal consists of a residential development of a single 2-storey dwelling. The land is currently garden space associated with Woodbine Cottage. The site is bordered to the north by an access track separating the property from the A635 Doncaster Road. To the west is the existing dwelling at Woodbine Cottage, with open land to the east and south.

3.0 Assessment Criteria

- 3.1 The nationally accepted design standards for residential premises are contained in BS 8233:2014. Table 4 of the standard contains the following design targets for residential dwellings, which are adopted in the assessment that follows:

BS8233:2014 Table 4 – Indoor ambient noise levels for dwellings

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

- 3.2 There is no longer an LAMAX standard for bedrooms In BS 8233. However, footnote 4 to Table 4 states that *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or LAMax,F depending on the character and number of events per night. Sporadic noise events could require separate values."* In this case, it is proposed that the previous BS 8233 internal standard (also referenced in World Health Organisation Guidelines for Community Noise) is applied. This is 45 dB LAMAX, inside bedrooms.
- 3.3 In summary, the assessment has been undertaken by comparing the modelled level of road traffic noise, with internal criteria from BS8233:2014.

External Areas (Amenity Space)

- 3.4 For outdoor areas (i.e. gardens/terraces and balconies), BS 8233:2014 recommends that *"it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T."* However, the document recognises that these guideline values are not achievable in all circumstances and in higher noise areas, a compromise might be warranted. In such circumstances, development should be designed to achieve the lowest practicable levels in these external amenity spaces". A 55dB LAeq,T target is a robust and reasonable one to adopt in this instance.
- 3.5 It should be noted that the guideline values in BS8233, derived originally from the World Health Organisation Guidelines for Community Noise, reflect the Lowest Observable Adverse Effect Level (LOAEL). That is, they are not limits, but levels below which the effects of noise are negligible. Significant effects (i.e. the Significant Adverse Effect Level, SOAEL) would not occur until much higher degrees of exposure. In other words, design for compliance with the LOAEL levels given in the documents would robustly meet the first aim of the NPPF in avoiding significant adverse impacts and the second aim in mitigating and minimising other adverse impacts.

4.0 Noise Modelling

- 4.1 Modelling of the noise environment was undertaken using 3-dimensional noise mapping software, SoundPLAN. This enabled noise contours and façade noise levels to be calculated across the site showing the impact of noise from the A635 on the proposed dwelling. The calculation was informed by available traffic data for the A635 and the methodology used for the calculations is in accordance with "Calculation of Road Traffic Noise". The recommended proposed mitigation in the form of a 2.4-metre high solid fence to the eastern boundary of the site (see below) is included in the models.
- 4.2 The full modelling results are included in Appendix B. These show the calculated daytime LAeq,16Hr levels at the location at the facades of the building (figures in hexagons are façade levels) and contours across the external areas of the site (free-field levels).

5.0 Design and Mitigation Measures

- 5.1 In order to achieve internal sound levels within the criteria set out above, calculations have been undertaken as to the required sound insulation performance of the building fabric, using the measured road traffic noise spectra, and typical window sizes, room volumes and wall configurations. The acoustic performance of the elements is expressed below in terms of Sound Reduction Index (R) in octave bands.
- 5.2 For all windows normal “thermal” double-glazing would be provided as a matter of course to comply with the thermal requirements of the Building Regulations, and this would also provide an adequate sound insulation performance for the southern and western elevation. A typical performance would be as follows:

Typical Window System Performance – Habitable Rooms in N and W Elevation

R dB	Octave band centre frequency Hz							
	63	125	250	500	1k	2k	4k	R _w +C _{TR}
e.g. 4-20-6	20	24	23	28	38	40	42	31

- 5.3 For the northern and eastern elevations, a slightly enhanced acoustic performance would be required, as follows:

Enhanced Window System Performance – Habitable Rooms in S and E Elevation

R dB	Octave band centre frequency Hz							
	63	125	250	500	1k	2k	4k	R _w +C _{TR}
e.g. 10-12-6	22	27	26	33	39	39	47	34

Ventilation

- 5.4 Ventilation, in accordance with Building Regulations, would need to be provided to habitable rooms. This would normally be achieved by way of vents in the window frames or through the walls or via a whole-building system (such as a Mechanical Ventilation and Heat Recovery System, MVHR). The acoustic performance of the vents should be such as to not degrade the sound insulation performance of the façade as a whole.
- 5.5 Appropriate ventilation performance can be achieved in this case with standard trickle vents or air bricks in most rooms, with enhanced “acoustic” ventilators (minimum performance of 40 dB D_{n,e,w} +C_{TR}) where the enhanced glazing performance is required. A mechanical (MVHR) system is preferable, and recommended where available.

External Amenity Space

- 5.6 The garden area is located to the rear of the dwelling and would, as such achieve the 55 dB LAeq,16 Hour target level in at least some parts of the garden (principally patio areas near to and screened by the building) without the need for further mitigation. It was recommended to the applicant as part of the acoustic assessment process, and is proposed, that a solid fence be provided along the entire eastern boundary of the site to minimise garden exposure to the A635 to the east. A recommended height for this fence is 2.4 metres, to ensure adequate screening of road traffic noise at ground floor level across the site and maximise the area of garden within the 55dB target level.

Summary

- 5.7 The internal criteria can be met comfortably with the recommended minimum standards of glazing and ventilation set out, including a slightly enhanced "acoustic" double-glazing and acoustic ventilation specification to some exposed bedrooms. The internal noise environment for future residents would be acceptable on that basis.
- 5.8 External amenity space will achieve appropriate sound levels across a maximised area with mitigation in the form of solid 2.4-metre acoustic fencing to the eastern boundary.

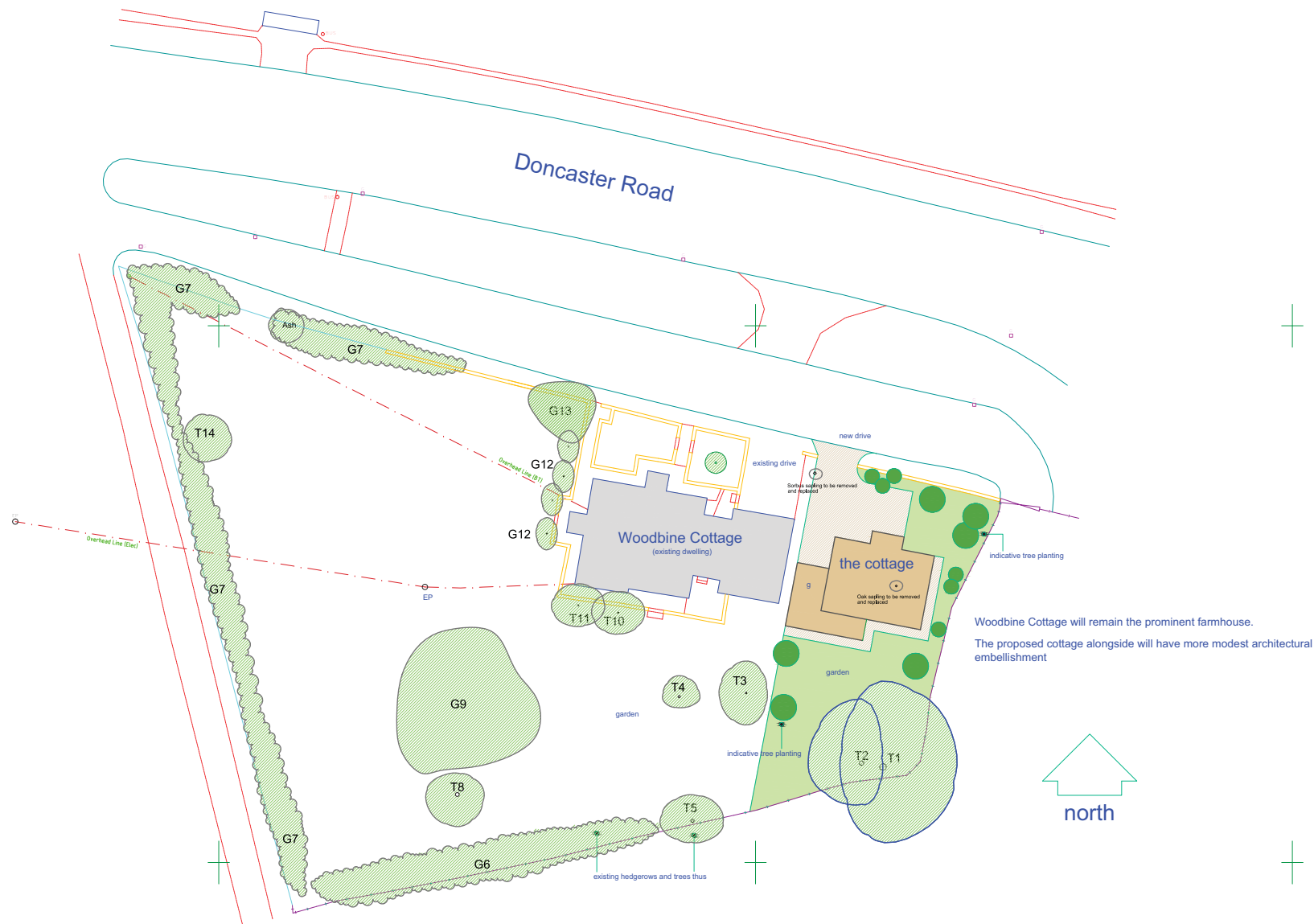
6.0 Conclusions

- 6.1 Noise modelling has been conducted, assessing road traffic noise affecting the site.
- 6.2 Internal and external noise level criteria have been proposed in line with the standards set out in BS 8233:2014 and (where applicable) the World Health Organisation Guidelines.
- 6.3 External noise levels are such that internal criteria can be met comfortably with the standard specification double-glazing to quieter elevations, with enhanced glazing being required on the northern and eastern facades.
- 6.4 Ventilation can be provided by standard trickle vents, with acoustic ventilators required where the enhanced glazing specification is to be installed. MVHR is preferred and recommended.
- 6.5 External sound levels will be comfortably within BS8233 recommendations across a maximised area of the rear garden through the provision of a 2.4-metre solid fence along the eastern boundary of the site.
- 6.6 The development can, therefore, provide an acceptable noise climate for future residents, in line with the appropriate design and guidance standards.

Appendices

Appendix A: Site proposal/Location

1) This drawing and the design and details depicted thereon are the copyright of Peter Dimberline Chartered Architect.
 2) All dimensions on this drawing are to be checked by the Contractor and any discrepancies are to be reported to the Architect.
 3) Do not scale critical dimensions off this drawing.
 4) Contractor to ensure that all Health & Safety requirements (CDM Regulations) in relation to this project will be complied with.



Woodbine Cottage will remain the prominent farmhouse.
 The proposed cottage alongside will have more modest architectural embellishment

proposed site layout at 1:200

REVISIONS

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CHARTERED ARCHITECT

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CLIENT
 Stephen and Jayne Selway

PROJECT
 Proposed residential development
 of 1 detached dwelling

LOCATION
 Woodbine Cottage, Doncaster Road,
 Billingley, Barnsley S72 0JE

DRAWING
 Proposed site layout

SCALES 1:200 DATE Feb' 20

DRWG No. 2019/08/03

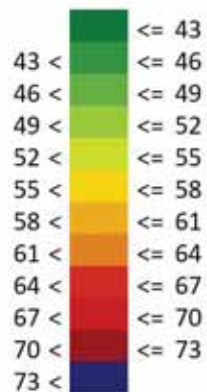
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Appendix B: Noise Survey Results

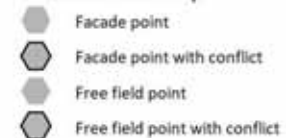
Noise level - 2.4 metre barrier
 LAeq16Hour
 in dB
 Receivers on facade a facade levels



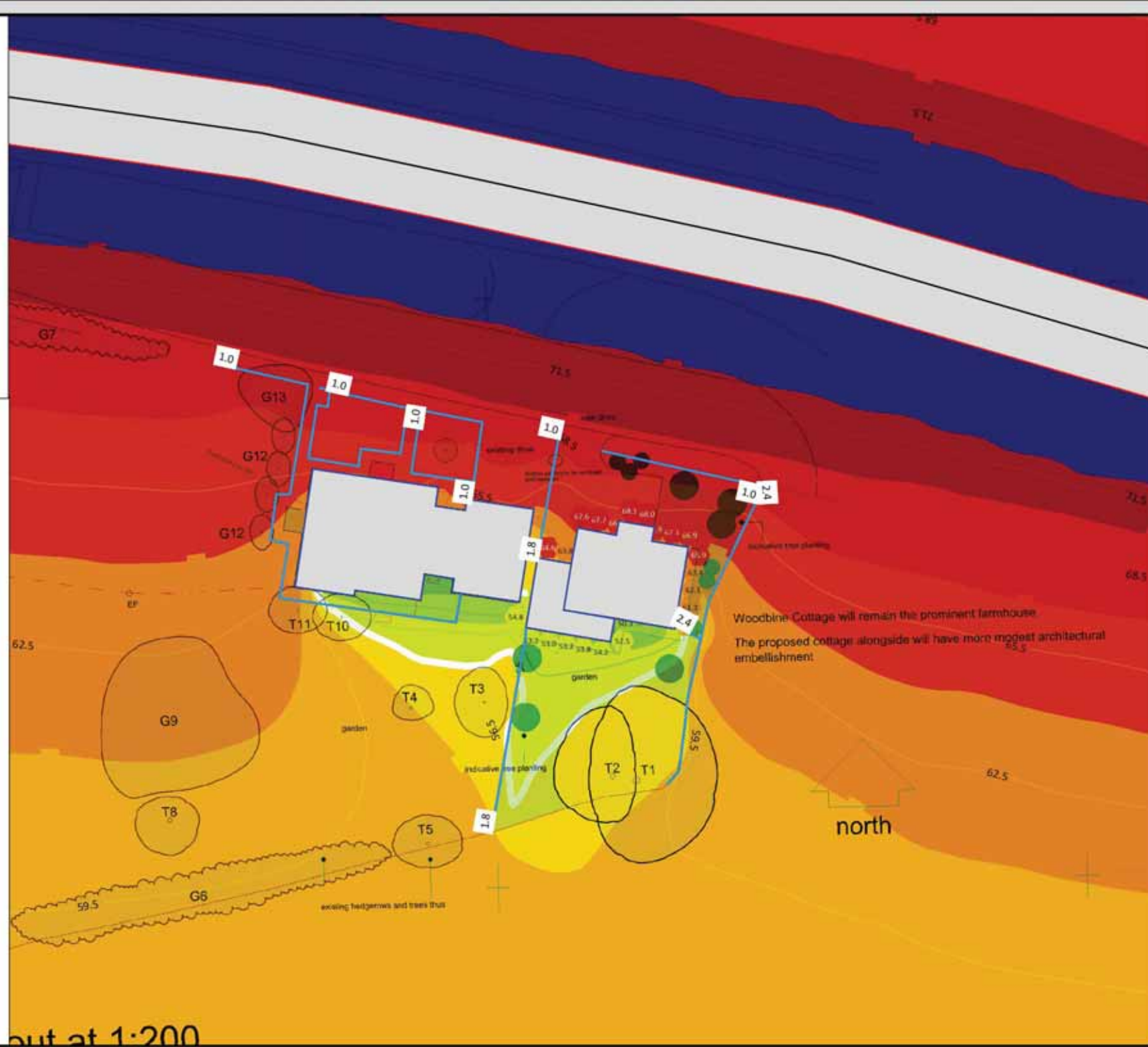
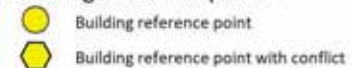
Signs and symbols



Facade Noise Map



Building reference points



out at 1:200