DOWNSVIEW DEVELOPMENTS LIMITED

NAIRN HOUSE
ARTEX AVENUE, RUSTINGTON, WEST SUSSEX, BN16 3LN

Noise Impact Assessment

September 2016

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Environmental Assessment Services Ltd

ARUN DISTRICT COUNCIL R/261/16/DOC

REPORT DATA SHEET

Requirement	Data
Report Ref	Downsview/Rustington/Noise
Date	September 2016
Client	Downsview Developments Limited
Report type	Noise Impact Assessment
Purpose	Planning
Revisions	Revision 2 September 2016
Prepared by	Amy Kitching BSc (Hons) Signed [redacted]
Approved by	Eur Ing Malcolm McKemey BSc (Hons), CEng, CEnv, MICE, MIEAust, MCIWEM, MIEnvSc Signed [redacted]

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DOWNSVIEW DEVELOPMENTS LIMITED

NAIRN HOUSE, ARTEX AVENUE, RUSTINGTON, WEST SUSSEX, BN16 3LN

Noise Impact Assessment

September 2016

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Noise Impact Assessment

September 2016

1. THE SITE AND BACKGROUND

1.1 The site comprises a three-storey former office building, with parking area to the front (south), at the junction of Artex Avenue and Dominion Way on the southern edge of the Rustington Trading Estate. The OS map reference for the site is TQ 0511 0312. The approximate site elevation is +12 m OD. See Appendix A, Figure 1 Site Location and Figure 2 Site Surroundings.

1.2 It is proposed to convert the existing building for residential use, to comprise 6 No. one bedroom apartments and 6 No. studio flats. See Appendix B, Architect's Drawings for existing and proposed layout.

1.3 According to Table 1 of *Planning Noise Advice Document: Sussex* of March 2013, a Noise Report may required for a change of use to residential where there are existing noise sources in close proximity. In this case, the main concern is that ambient noise levels at the site may adversely impact on the proposed future residents.

1.4 The surrounding land uses comprise commercial and light industrial to the north, east and west, with a row of residential houses to the south. Most of the commercial activities to the north, east and west appear to be retail warehouse type businesses and do not involve particularly noisy activities. A warehouse currently used for the distribution of electrical spares and motor components (KEW) is located adjacent to the north of the site. Some of the activities within the other units are motor trade related and may include air compressors and air powered tools.

1.5 The principal noise source at the site is considered to be traffic on Artex Avenue and Dominion Way, including a proportion of heavy goods vehicles. There is also some distant traffic noise from Worthing Road to the south. Other (less significant) noise sources include various commercial and light industrial activities in the surrounding units. The South Coast railway line passes some 300 m to the north of the site, although this is not thought to be a significant noise source at the site.

1.6 A noise impact assessment has been carried out in accordance with the recommendations given in the *National Planning Policy Framework* (NPPF) March 2012. Reference has been made to the *Planning Noise Advice Document: Sussex*, the British Standard Guidance on Sound Insulation and Noise Reduction for Buildings (BS 8233:2014) and the World Health

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Organisation publications Night Noise Guidelines for Europe 2009 and Community Noise Guidelines 1999.

2. DEFINITIONS

2.1 Noise assessment terms used in the report are defined and described below:

$dB_{(A)}$ – the unit of noise measurement that expresses the loudness in terms of decibels (dB) weighted by frequency for human sensitivity to sound (A).

$L_{(A)90}$ – A-weighted sound pressure level exceeded for 90% of the measured time; defined as 'background noise level'.

$L_{(A)eq}$ – equivalent continuous A-weighted sound pressure level over a given period of time; defined as 'average noise level'.

$L_{(A)max}$ – equivalent maximum A-weighted sound pressure level over a given period of time; defined as 'maximum sound level'.

$L_{(A)i0}$ – A-weighted sound pressure level exceeded for 10% of the measured time; a measure frequently referred to relating to traffic noise.

R_w - Weighted sound reduction index. See BS 8233:2014.

3. THE ASSESSMENT

3.1 The assessment comprised:

- Selection of suitable noise monitoring stations.
- Installation of the noise monitoring apparatus for suitable monitoring periods.
- General observations of factors affecting noise around the site.
- A review of the results of the monitoring.
- Provision of recommendations regarding noise attenuation options, where indicated.

3.2 Noise monitoring was carried out at the site between Tuesday 6th and Friday 9th September 2016. Noise levels at the site during the monitoring were considered to be reasonably representative of the ambient noise at the site.

3.3 Continuous noise monitoring was carried out at the southern (front) façade of the building, overlooking the junction of Artex Avenue and Dominion Way. This facade was deemed to be exposed to the most traffic noise and contained the principal fenestration of the building. During the continuous monitoring, the SLM microphone boom was projected some 1.5 m from the second floor window on the southern façade of the building. The measurements may be considered to be reasonably "free field" and not significantly affected by façade reflection. See Appendix A Figure 2 for Monitoring Locations.

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3.4 Additional short-term noise monitoring was carried out internally within the building and externally at the east and west ends of the site. The short term internal and external noise monitoring was carried out on 9 September 2016, with the SLM mounted on a tripod some 1.5 m above ground level. See Appendix A Figure 2 for Monitoring Locations.

3.5 The monitoring was carried out using a CEL (Casella) Type 490C Precision Sound Level Meter (SLM) and CEL-110/1 field calibrator (calibrated to national standards on 31 March 2016 – see certificate in Appendix C). The SLM was field calibrated before and after each monitoring session and no measurable drift was observed. Calibration readings before and after the monitoring sessions were all 113.9 dB.

4. RESULTS OF THE MONITORING

4.1 The results of the continuous noise monitoring are summarised in Tables 4.1 and 4.2 below:

TABLE 4.1
AMBIENT DAYTIME NOISE LEVELS

MONITORING LOCATION	1. 2nd Floor southern façade microphone boom			
PERIOD	16:44 - 23:00 on 6 Sept, 07:00 – 23:00 on 7 & 8 Sept & 07:00 – 15:30 on 9 Sept 2016			
NOISE LEVELS $dB_{(A)}$	$L_{(A)eq}$	$L_{(A)90}$	$L_{(A)10}$	$L_{(A)max}$
	58.9	52.4	61.5	92.1
WEATHER	Light winds, generally dry			
PRINCIPAL NOISE SOURCES	Traffic on Artex Avenue and Dominion Way, plus distant traffic on Worthing Road			

TABLE 4.2
AMBIENT NIGHT-TIME NOISE LEVELS

MONITORING LOCATION	1. 2nd Floor southern façade microphone boom			
PERIOD	23:00 – 07:00 on 6/7, 7/8 & 8/9 Sept 2016			
NOISE LEVELS $dB_{(A)}$	$L_{(A)eq}$	$L_{(A)90}$	$L_{(A)10}$	$L_{(A)max}$
	51.5	42.1	53.0	83.9
WEATHER	Light wind, dry			
PRINCIPAL NOISE SOURCES	Distant traffic on Worthing Road, occasional traffic on Artex Avenue/Dominion Way			

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4.2 The traces from the continuous monitoring at Monitoring Location 1 and the associated frequency data are given in Appendix D.

4.3 The results of the short-term internal and external noise monitoring are given in Appendix D and summarised in Table 4.3 below:

TABLE 4.3
INTERNAL & EXTERNAL
SHORT-TERM NOISE MONITORING RESULTS

LOCATION		Period (mins)	$L_{(A)eq}$ $dB_{(A)}$	$L_{(A)90}$ $dB_{(A)}$	$L_{(A)10}$ $dB_{(A)}$	$L_{(A)max}$ $dB_{(A)}$
2	Internal with windows closed on first floor on east side of Nairn House.	18	41.7	34.5	43.5	68.8
3	Internal with windows closed on second floor on west side of Nairn House.	16	38.4	29.0	39.0	62.1
4	External at ground level at eastern end of site, in line with rear (north) facade of Nairn House.	5	58.0	49.5	62.0	71.1
5	External at first floor level, at western end of site on fire escape.	7	54.8	49.5	58.0	67.7

5. INTERPRETATION OF THE RESULTS

5.1 The meteorological conditions at the site throughout the monitoring period were generally quiescent, dry and warm, therefore no allowance for weather conditions was considered necessary.

5.2 The World Health Organisation (WHO) recommends an internal noise level of no more than 30 $dB_{(A)}$ $L_{(A)eq}$ to permit restful sleep. The same night-time guideline is given in BS 8233:2014. Night time is classed as 23:00 - 07:00 hours. The permitted maximum daytime internal $L_{(A)eq}$ is given as 35 $dB_{(A)}$ in BS 8233:2014. Internal noise measurements recorded during the monitoring period show $L_{(A)eq}$ values greater than 35 $dB_{(A)}$. This would suggest that the level of attenuation presently provided by the building is inadequate. The results of the noise monitoring undertaken at the site indicate that some 29 $dB_{(A)}$ of attenuation will have to be provided in order to meet guideline values.

5.3 WHO guidance states that the number of individual night-time noise events ($L_{(A)max}$) exceeding 45 $dB_{(A)}$ within a bedroom should be limited. This is generally taken as not more than eight exceedences of 45 $dB_{(A)}$ during a single night. From the $L_{(A)max}$ trace for the night-time period, it is apparent that $L_{(A)max}$ individual events of >75 $dB_{(A)}$ were recorded on average between two and six times per night. This suggests that an attenuation of >30 $dB_{(A)}$ would

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be required in order to limit internal exceedences of 45 $dB_{(A)}$ night time noise events to less than eight. This also suggests that the attenuation levels calculated in 5.3 above should be increased by 1 $dB_{(A)}$ to 30 $dB_{(A)}$.

5.4 The highest peak ($L_{(A)max}$) noise level recorded during the daytime monitoring was 92.1 $dB_{(A)}$, recorded at Monitoring Location 1. The source of this peak noise level is uncertain, but most likely to be due to a noisy vehicle passing the site or a seagull call near to the microphone.

5.5 The building has been stripped and is largely open-plan. There are some sections of the inner leaf of the wall missing and openings in the floor. An external ground floor door was found to be open during the monitoring. Sticky residue left where floor tiles had been removed throughout the second floor made it impossible to walk silently to attend the SLM during the monitoring period.

5.6 It is acknowledged that the building condition during the internal monitoring may have affected the measurements. The internal noise levels are likely to be lower when the dividing walls, floor coverings and other finishings are installed. If the existing windows are to be retained, the sealing around the frames should be checked for soundness.

5.7 The external walls are brick, comprising two single (stretcher bond) brick leaves with a cavity. The front and side facades have been over-clad in aluminium panelling. The walls have been dry-lined internally with plasterboard on dabs. BS 8233:2014 suggests that this type of construction should provide 50 - 54 dB of attenuation (R_w), which would be adequate in this case.

5.8 The building has a flat membrane covered roof. As the internal noise levels were lower on the top floor, compared to the first floor, it is considered that the roof is providing adequate attenuation. It is understood that the roof is not currently insulated, but that the proposed redevelopment includes for roof insulation. In this case, no additional noise attenuation measures are indicated for the roof.

5.9 The existing windows appear to be standard thermal double-glazed sealed units, which should provide around 32 $dB_{(A)}$ of attenuation when closed. However, they will provide only around 15 $dB_{(A)}$ of attenuation when open. Opening windows to permit cooling on hot days or nights will tend to result in internal noise levels exceeding both the WHO and BS standards. It will therefore be necessary to install acoustic ventilation in order to provide an alternative to opening windows for room ventilation. In order to ensure internal noise levels remain below the WHO and BS thresholds, the ventilation should provide at least 30 $dB_{(A)}$ attenuation. This may achieved by the installation of passive acoustic ventilation.

5.10 Plans for the proposed redevelopment indicate new fenestration for the ground floor. As noise levels may be 3 - 5 $dB_{(A)}$ higher at ground level, it is recommended that these (and any other new windows) should be an acoustic

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double-glazed type, providing at least 35 $dB_{(A)}$ of attenuation. Acoustic ventilation providing at least 35 $dB_{(A)}$ attenuation should also be installed on the ground floor to ensure internal noise levels remain below the WHO and BS thresholds.

5.11 For external areas, the WHO community noise guidelines suggest 55 $dB_{(A)}$ $L_{(A)eq}$ as the threshold for annoyance, with the BS 8233:2014 stating that noise which does not exceed 50 $dB_{(A)}$ $L_{(A)eq}$ to be "desirable". In this case, the external area will be used for car parking at the front of the building, and will not be an area used for residents' recreation.

5.12 The proposed redevelopment of the building will have some noise impacts. However, most of the refurbishment will be internal and, as long as the work is restricted to normal business hours, the noise impacts on adjacent residential receptors should not be a significant concern.

5.13 All the significant noise sources noted during the site visits appeared to be external. No noise from the adjoining warehouse (currently occupied by KEW, which use the unit for the distribution of electrical spares and motor components) was apparent inside Nairn House. However, there is a specific concern regarding potential noise impacts due to the site's location in Rustington Trading Estate. For example, the site could be exposed to greater levels/duration of noise if the existing commercial and light industrial activities were replaced by noisier activities (still appropriate for a trading estate). This could result in future residents within the site complaining of noise nuisance. The most likely sources of increased noise would be additional heavy goods vehicles and/or noisy processes operating in the units immediately behind the site (presently occupied by KEW). It is difficult to speculate what changes in noise level there could be, however the noise monitoring carried out at the site suggested similar ambient noise levels to those previously measured at a number of trading estates elsewhere in Sussex. Precautionary measures for potential changes in noise level could include upgrading the dry lining of the party wall between Nairn House and the adjacent warehouse from plasterboard on dabs to plasterboard over acoustic board on 50 mm battens with mineral wool quilt insulation over and between the battens.

6. CONCLUSIONS & RECOMMENDATIONS

6.1 The National Planning Policy Framework (NPPF) states that sustainable development should:

i. Avoid noise from giving rise to significant adverse impacts on health and quality of life.

ii. Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise, including through the use of conditions attached to planning consents.

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iii. 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.

iv. Identify and protect areas of tranquillity, which have remained relatively undisturbed by noise and are prized for their recreational and amenity value.

6.2 The requirement for a Noise Report is set out in Table 1 of *Planning Noise Advice Document: Sussex* of March 2013. A Noise Report is required for the proposed redevelopment (including a change of use to residential), as the site is located where there are existing noise sources in close proximity.

6.3 The site is located close to the junction of Artex Avenue and Dominion Way on the southern edge of the Rustington Trading Estate. Principal noise sources appear to be traffic, including a proportion of heavy goods vehicles, passing the site.

6.4 Most of the commercial activities to the north, east and west appear to be retail warehouse type businesses and do not involve particularly noisy activities. Some of the activities are motor trade related and may include air compressors and air powered tools. The land use to the south of the site is residential.

6.5 Noise monitoring was undertaken at the site between Tuesday 6th and Friday 9th September 2016. The monitoring results confirm that the site is exposed to significant levels of noise, and some noise attenuation measures will be required in order to achieve an appropriate internal noise level suitable for residential use.

6.6 In order to achieve the desired <30 $dB_{(A)}$ $L_{(A)eq}$ within the proposed bedrooms, and accounting for night-time peak noise events, it will be necessary to provide >30 $dB_{(A)}$ of attenuation against airborne noise. This should be achieved by the existing standard thermal double glazing, although it will be necessary to ensure that the frames are adequately sealed. Acoustic ventilation providing >30 $dB_{(A)}$ of attenuation will be required to provide an alternative to opening windows for room cooling. The new windows for the ground floor and any other new windows should be an acoustic double-glazed type providing at least 35 $dB_{(A)}$ of attenuation, with acoustic ventilation of a similar attenuation rating.

6.7 The existing walls and roof are considered to provide adequate attenuation against airborne sound transmission.

6.8 The external area will be used for car parking at the front of the building, and will not be an area used for residents' recreation. No specific noise attenuation measures are proposed for this area.

6.9 The proposed redevelopment of the building (mostly comprising internal refurbishment) should not have significant adverse noise impacts on adjacent

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residential receptors, as long as the work is restricted to normal business hours.

6.10 There is a specific concern that the site's location in Rustington Trading Estate could be exposed to greater levels/duration of noise if the existing commercial and light industrial activities were replaced by noisier processes. It is difficult to speculate how the ambient noise levels at the site could change, however the noise monitoring carried out at the site suggested similar ambient noise levels to those previously measured at a number of trading estates elsewhere in Sussex. Precautionary measures for potential changes in noise level could include upgrading the dry lining of the party wall between Nairn House and the adjacent warehouse from plasterboard on dabs to plasterboard over acoustic board on 50 mm battens with mineral wool quilt insulation over and between the battens.

6.11 The conclusion of this assessment is that, subject to implementing the mitigation and attenuation measures recommended above, the proposed development should not give rise to significant adverse noise impacts on the health and quality of life of the proposed future residents.

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APPENDIX A
Figure 1 : Site Location
Figure 2: Site Surroundings and Monitoring Locations

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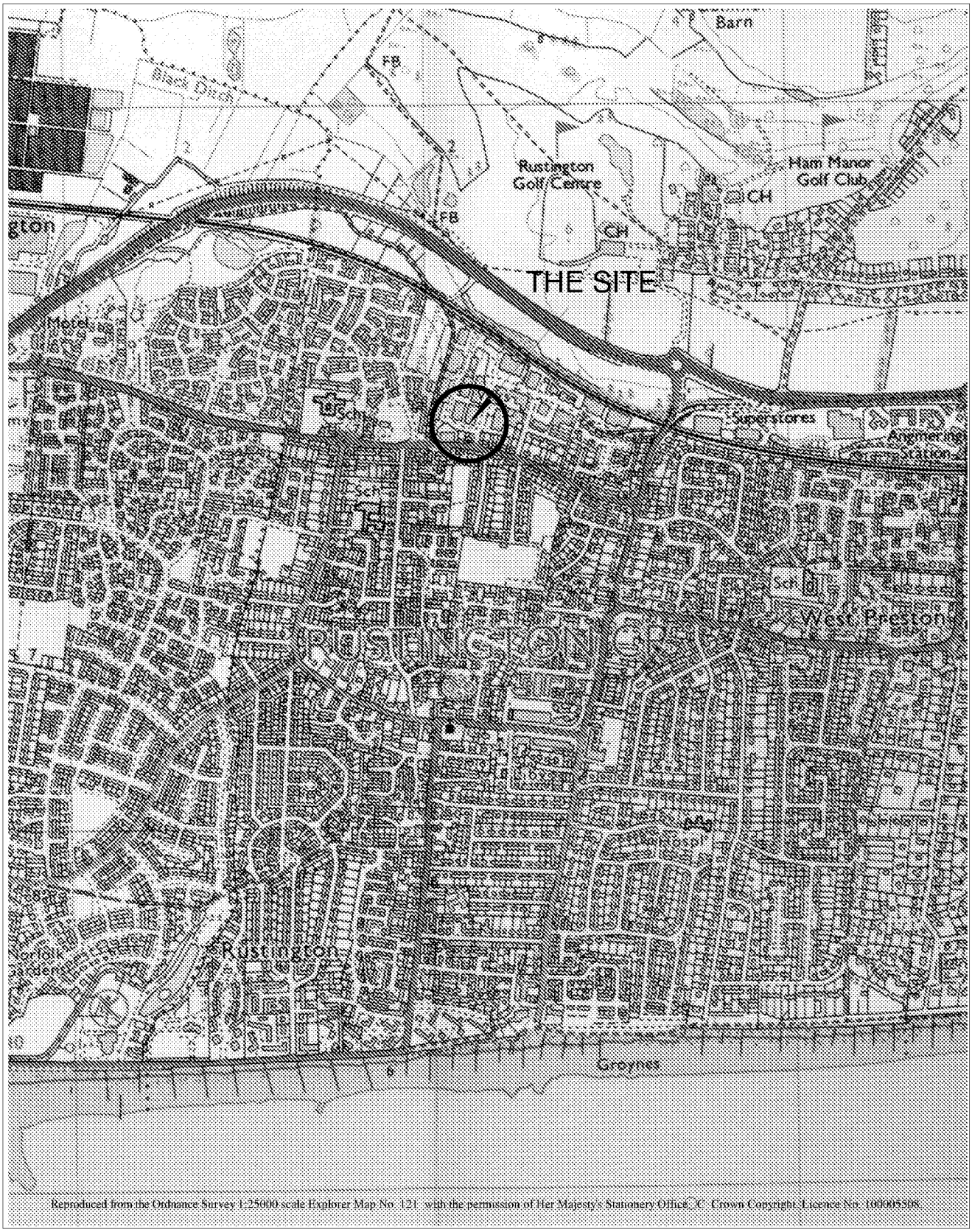

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NAIRN HOUSE, ARTEX AVENUE, RUSTINGTON, BN16 3NL

Figure 1: Site Location

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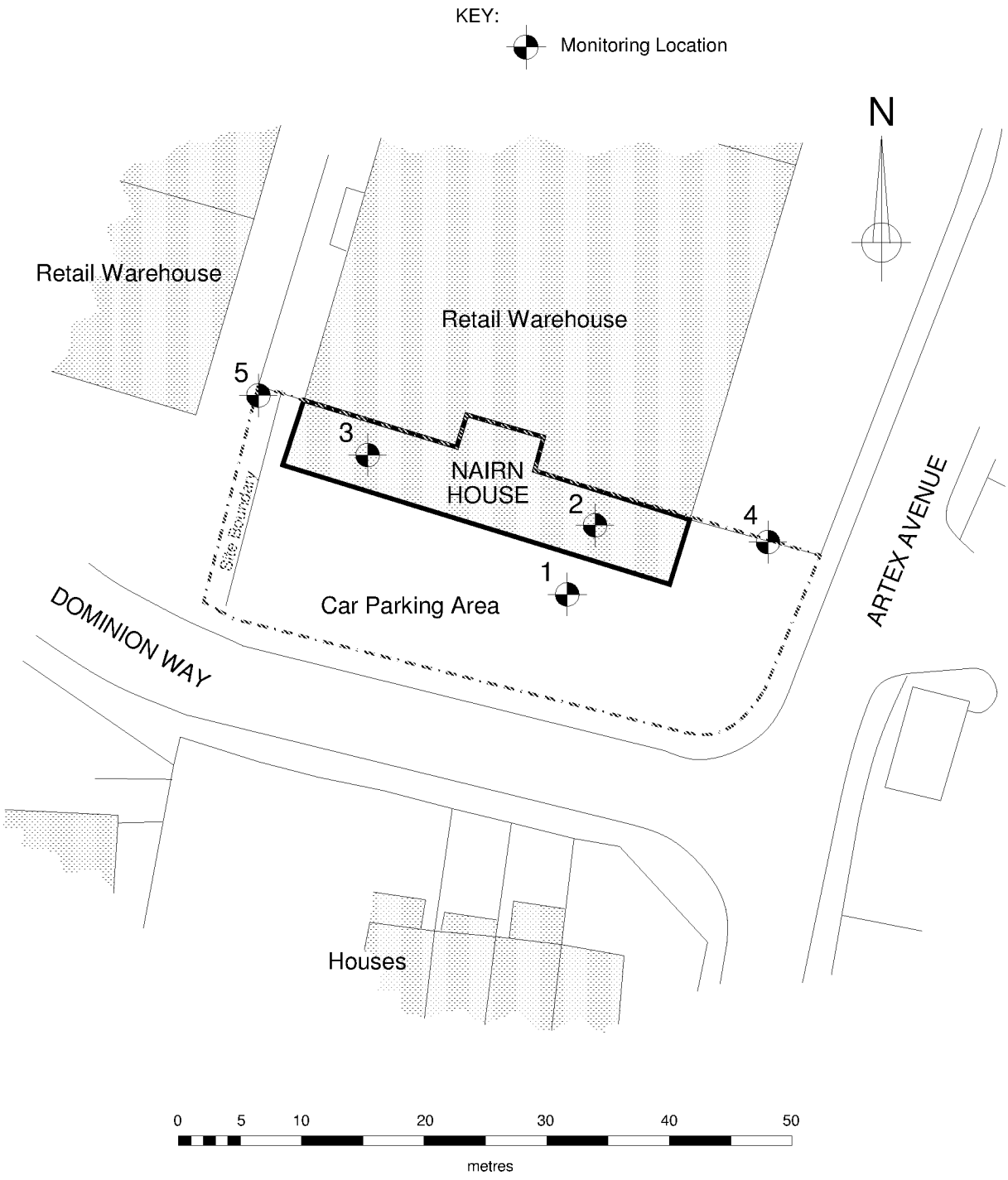

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Figure 2: Site Surroundings and Monitoring Locations

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APPENDIX B
Architect's Drawings

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Location Plan 1:1250

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CLIENT:
Downsview Development

DRWG TITLE:
Location Plan

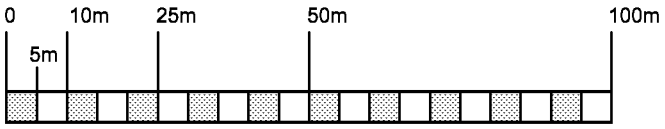
PROJECT TITLE:
Nairn House
Artex Avenue
Rustington
West Sussex

DATE: June 2016

SCALE: 1:1250

DRAWING NO. 1166/01

REVISION NO.



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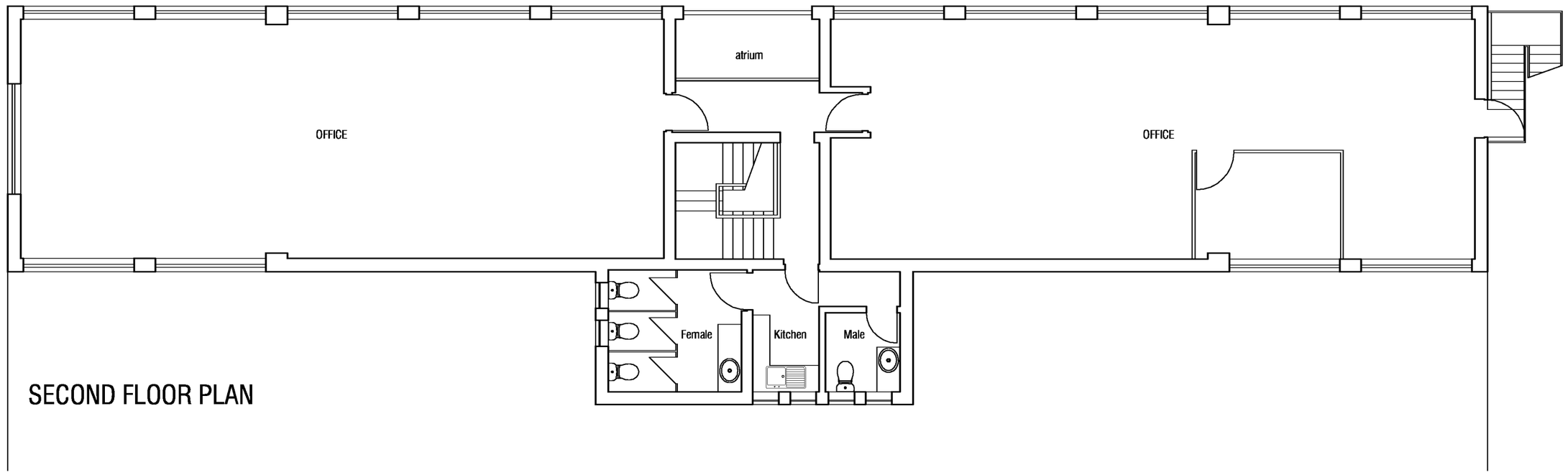

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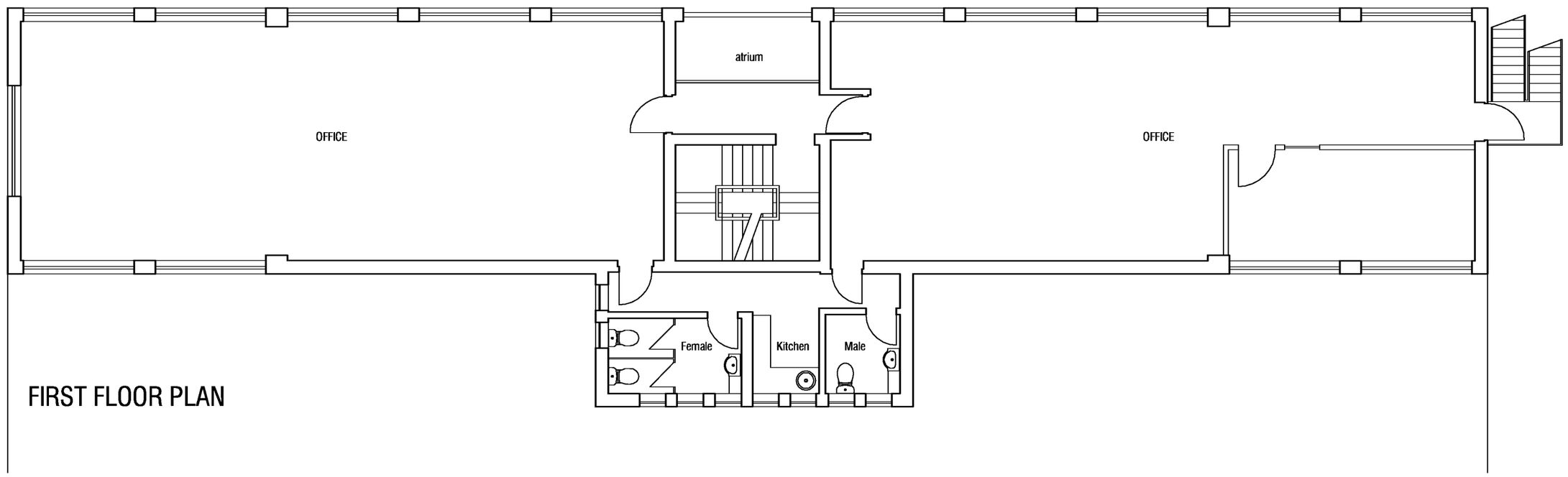

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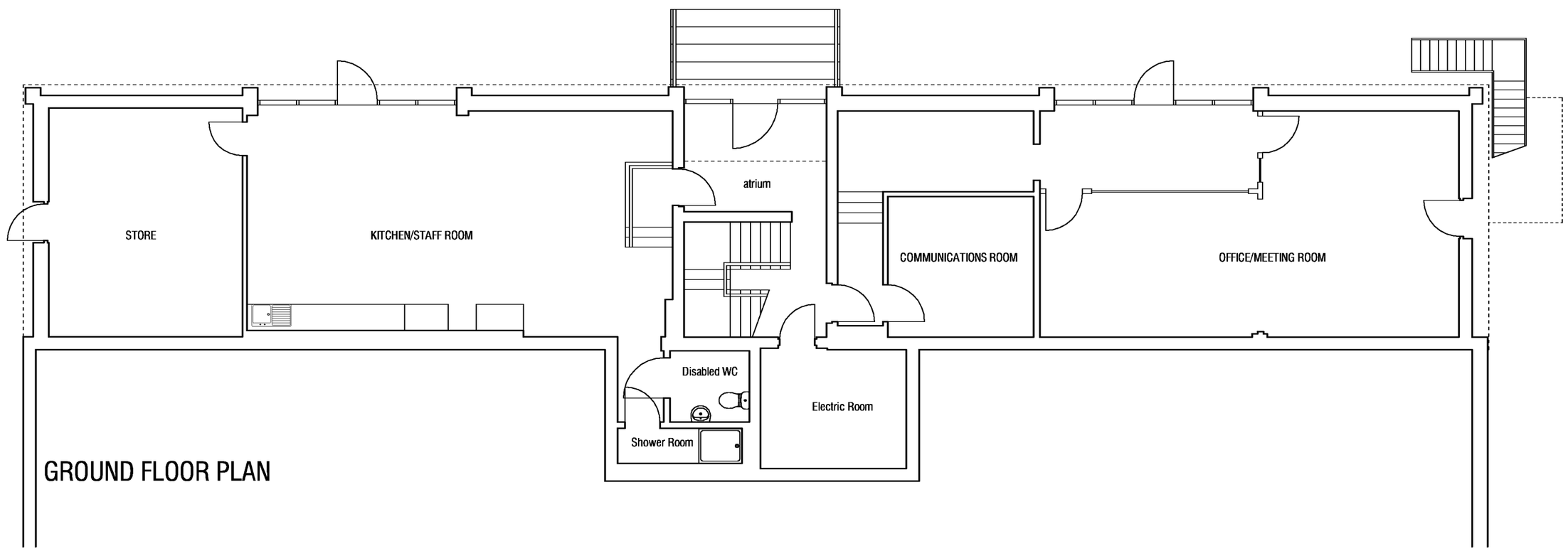

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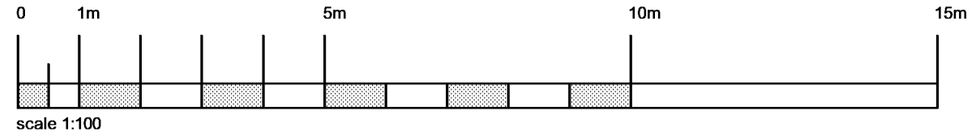

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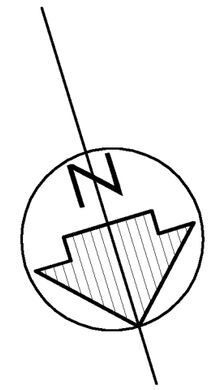

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CLIENT:
Downsview Developments Ltd

DRWG TITLE:
Existing Floor Plans

PROJECT TITLE:
Nairn House
Artex Avenue
Rustington
West Sussex

DATE: June 2016

SCALE: 1:100

DRAWING NO. 1166/02

REVISION NO.

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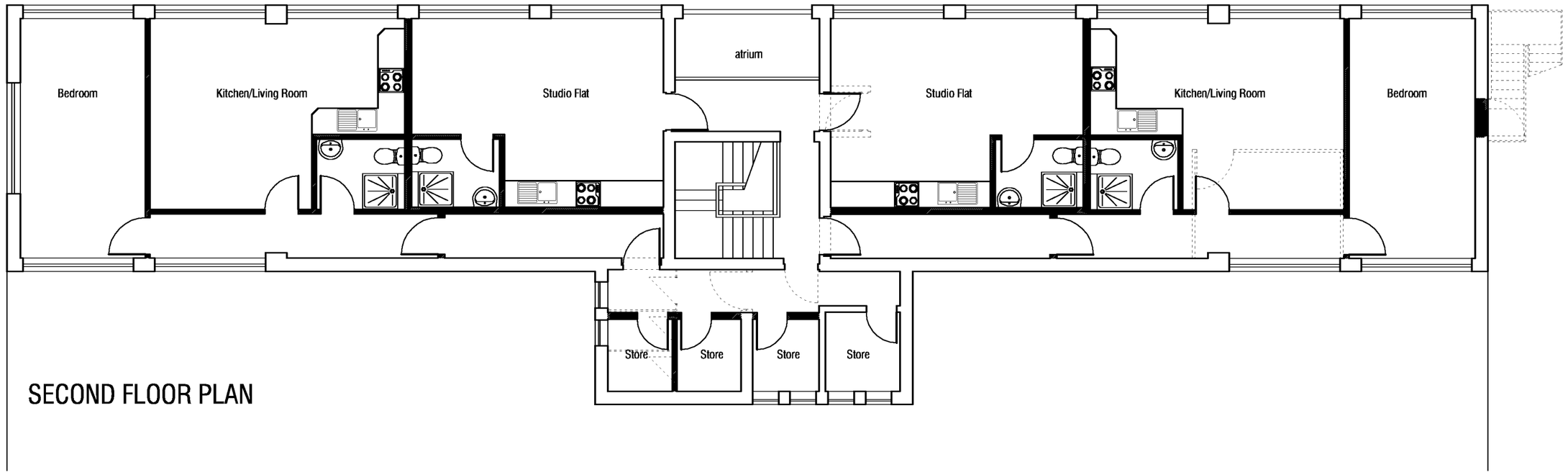

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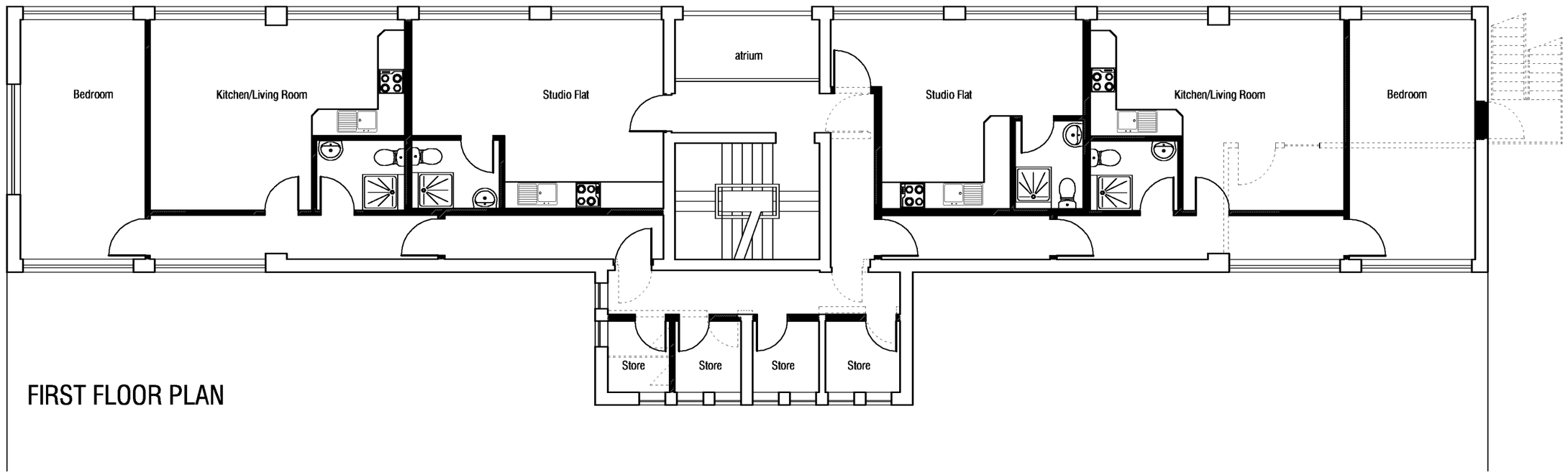

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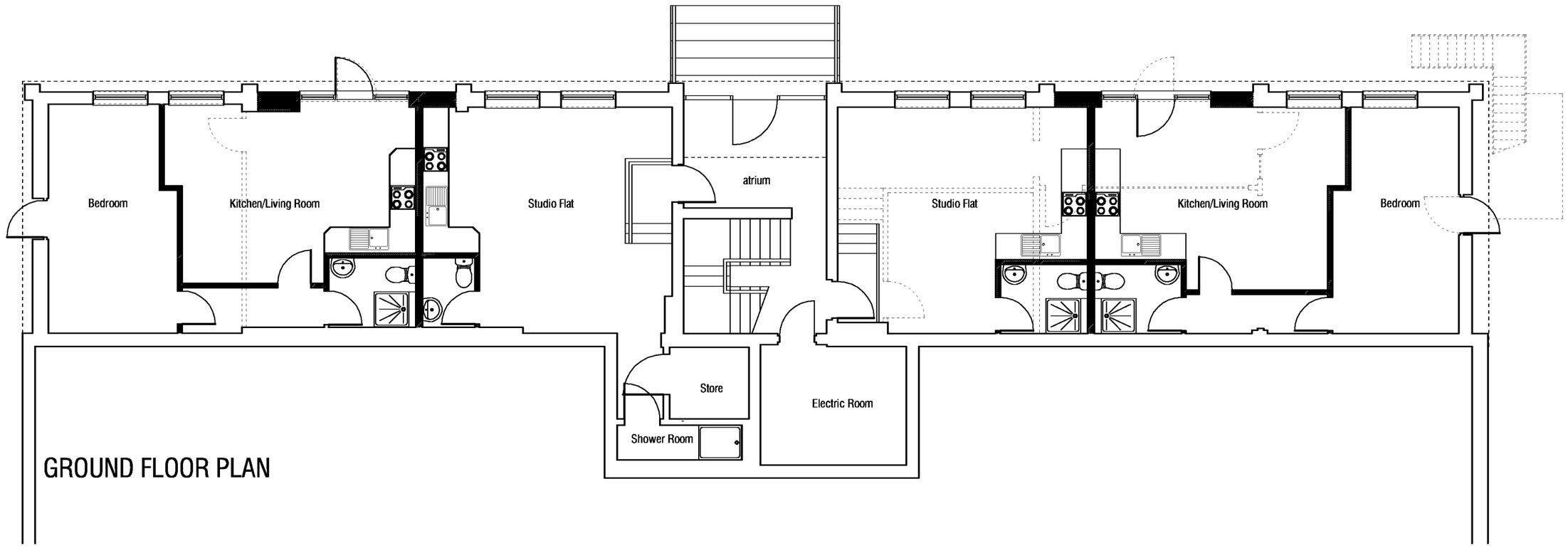

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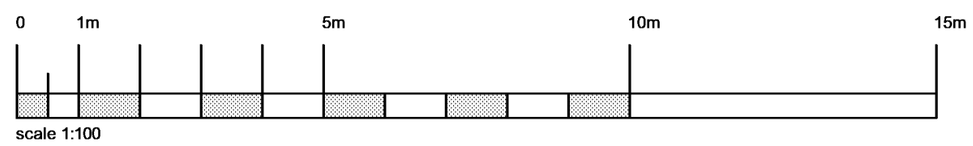

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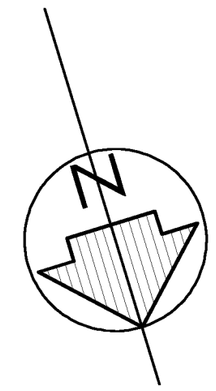

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CLIENT:
Downsview Developments Ltd

DRWG TITLE:
Proposed Floor Plans

PROJECT TITLE:
Nairn House
Artex Avenue
Rustington
West Sussex

DATE: June 2016

SCALE: 1:100

DRAWING NO. 1166/03

REVISION NO.

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APPENDIX C
Noise Monitor Calibration Certificates

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Acoustic Calibration Services Limited,
Unit 6F, Diamond Industrial Centre,
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Tel: 01462-610085/87 Fax: 01462-610087
e-mail: cal@acousticcalibration.co.uk
web: www.acousticcalibration.co.uk

ACSL
Acoustic Calibration Services Limited

CERTIFICATE OF CALIBRATION

Model: CEL-490.C1 **Serial No:** 129580

Organisation: Environmental Assessment Services Ltd., London Road Hickstead, Haywards Heath, West Sussex RH17 5LZ

Job Number: 2466 **Customer Order Reference:** Sandra Holland

The Sound Level Meter was assessed for conformance with International Standards *IEC 60651* and *IEC 60804* using test procedures described in *BS 7580* Part 1. The meter claims Type 1 accuracy conformance and it was against these requirements that all the results were evaluated.

The sound level meter was connected to a CEL-495 preamplifier Serial No. 001597 and a G.R.A.S. 40AE measurement microphone Serial No. 100742. The microphone has a nominal capacitance of 14 pF and the device used to apply electrical signals to the preamplifier was of the same nominal capacitance.

CEL-110/1 Acoustic Calibrator Serial No: 119427 was utilised in establishing the initial acoustic calibration setting.

The sound level meter passed all applied tests with no deviations from Type 1 specification, in accordance with *IEC 60651* and *IEC 60804*. Accordingly, the meter meets the requirements of *BS 7580* Part 1.

The sound level meter should be set to read 113.9dB when used with the associated acoustic calibrator, microphone and preamplifier as detailed above at reference atmospheric pressure.

All ACSL's calibration instrumentation is fully traceable to National Standards. The acoustic references are calibrated by laboratories which are UKAS accredited for the purpose.

Certificate No: **14949**
Date of Issue: **31st March 2016**

Signature: 
Print Name: **Trevor Lewis**

Registered Office: HW Associates, Portmill House, Portmill Lane, Hitchin, Hertfordshire SG5 1DJ
Registered No: 4143457 VAT No: GB 770503441
Directors: Trevor J Lewis, Owen R Clingan MIOA

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e-mail: cal@acousticcalibration.co.uk
web: www.acousticcalibration.co.uk

ACSL
Acoustic Calibration Services Limited

CERTIFICATE OF CALIBRATION

Model: CEL-110/1 **Serial Number:** 119427

Organisation: Environmental Assessment Services Ltd., London Road Hickstead, Haywards Heath, West Sussex RH17 5LZ

Job Number: 2466 **Customer Order Reference:** Sandra Holland

The acoustic calibrator was run for a period of time until a stable level was measured. The output level was compared to the certified level of the laboratory measurement references. The measurements were repeated 5 times and the average value calculated.

Ambient Temperature: **24.0** ± 1°C.
Barometric Pressure: **101.5** kPa.
Relative Humidity: **46** %

The sound pressure level output from the Acoustic Calibrator was measured in its half inch configuration using a CEL 250 microphone. The mean level output of the acoustic calibrator, corrected to the standard atmospheric pressure of 101.3kPa, was 94.0dB at the reference setting and 114.1dB at the +20dB setting.

The output frequency signal of the acoustic calibrator is 1000Hz.

All ACSL's calibration instrumentation is fully traceable to National Standards. The acoustic references are calibrated by laboratories which are UKAS accredited for the purpose.

Certificate No: **14948**
Date of Issue: **31st March 2016**

Signature:
Print Name: **Trevor Lewis**

Registered Office: HW Associates, Portmill Lane, Hitchin, Hertfordshire SG5 1DJ Registered No: 4143457 VAT No: GB 770505441
Directors: Trevor J Lewis, Owen R Clingan MIOA

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APPENDIX D
SLM Traces and Data

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See separate file

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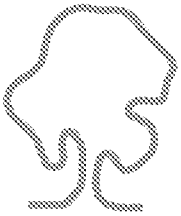

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