

## Appendix 13A – Glossary of Acoustical Terms

**AAWT:** Average Annual Weekday Traffic.

**“A”-Weighting:** A reduction/weighting applied to the low and high frequency components of noise applied to obtain a single number representing the sound pressure level of a noise in a manner approximating to the response of the human ear.

**Acoustic:** Pertaining to sound or to the sense of hearing.

**Ambient Noise:** The total of all noise in the environment, other than the noise from the source of interest.

**Attenuation:** The reduction of sound intensity by various means (e.g., air, humidity, porous materials).

**Background Noise:** The noise in the environment, other than the noise from the source of interest.

**Barrier:** A sound barrier is any solid obstacle, which is relatively opaque to sound that blocks the line of sight from the sound source to receiver. Barriers may be erected specifically to reduce noise, for example: solid fences, earth berms, or freestanding walls.

**CEMP:** Construction Environmental Management Plan.

**CRTN:** Calculation of Road Traffic Noise.

**Decibel (dB):** The decibel is a logarithmic unit of measure of sound pressure. One tenth of the bel.

**DM:** Do Minimum

**DS:** Do Something

**Environmental Noise:** Unwanted sound from various outdoor sources which produce noise. Environmental noise sources include aircraft, cars, trucks, buses, railways, industrial plants, construction activities, etc.

**Façade corrections:** A façade noise level is the noise level 1m in front of the most exposed window or door on the face of a building. The effect of reflection is to produce a slightly higher (+3dB) sound level than it would if the building was not there. This factor needs to be added when predicting noise levels.

**Frequency:** Number of complete oscillation cycles per unit of time. The unit of frequency is the Hertz (Hz).

**Hertz:** A unit of frequency, equivalent to one cycle per second.

**HGV:** Heavy Goods Vehicle

**HRA:** Hot Rolled Asphalt

**Hz:** Hertz

**LA10:** noise level that is exceeded for 10% of the measurement period, and gives an indication of the noisier portion of the climate. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

**LA90:** the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the 'background' noise level.

**LAeq:** Equivalent A-Weighted Sound Level, defined as the constant sound level that, in a given time period, would convey the same sound energy as the actual time-varying A-weighted sound.

**LAm<sub>ax</sub>:** The maximum sound level of an event, or time period, measured with a sound level meter or analyzer that is frequency weighted and time integrated. The frequency weighting (for example, A, C, unweighted) and time integrating (for example, slow, fast) must be specified.

**LNS:** Low noise road surfacing also referred to as a thin wearing course/surface. The UK Highways Agency advises that a reduction of in the region of 3.5 dB(A) can be achieved by the use of thin wearing course/surface compared to hot rolled asphalt (HRA). The principle effect is to reduce the noise within the mid and higher frequencies associated with the interaction of the vehicle tyres and the road surface. However, it is less effective in attenuating the low frequency noise primarily generated by HGV's

**Level:** The logarithm of the ratio of a quantity to a reference quantity of the same kind. The base of the logarithm, the reference quantity, and the kind of level must be specified.

**Logarithm:** The exponent that indicates the power to which a number must be raised to produce a given number. For example, for the base 10 logarithm, used in acoustics, 2 is the logarithm of 100.

**NIR:** Noise Insulation Regulations.

**Noise:** Any disagreeable or undesired sound or other disturbance.

**Noise Contours:** Continuous lines of equal noise level usually drawn around a noise source. The lines can be drawn in any increments specified on an appropriate legend. Noise contours are generally used in depicting the noise exposure around airports, highways, and industrial plants.

**Noise Map:** A noise map is a set of noise contours based upon measurements or predictions of noise in the region of interest.

**Noise Survey:** A noise survey is a set of measurements of the sound levels or sound exposures in an environment of interest.

**Propagation** - the passage of a signal from its source to a receiver. Some of the processes involved in propagation are absorption, reflection, and transmission.

**Receiver:** The listener or measuring microphone which detects the sound transmitted by the source.

**SPL:** Sound Pressure Level

**Vibration:** the oscillating, reciprocating, or other periodic motion of a rigid or elastic body or medium forced from a position or state of equilibrium.

**Windshield:** A porous device used to cover the microphone of a sound level measurement system which is designed to minimize the effects of wind on the sound levels being measured. Typically made of open cell polyurethane foam and spherically shaped.

## 13 Appendix 13B – Construction Noise Assessment

### Guidance and Methodology

#### 13.1 BS 5228-2:2009 – ‘Code of practice for noise and vibration control on construction and open sites’

- 13.1.1 This standard contains guidance on the prediction of noise levels at sensitive receptors from the operation of fixed and mobile noise sources found on construction and open (quarry and OCCS) sites.
- 13.1.2 It provides source sound level data for various machinery and tasks associated with the construction phase of a site. It also contains information pertaining to mitigation of noise from construction operations.
- 13.1.3 The standard, however, does not go as far as specifying acceptable working criteria in the form of noise limits, but Part 1 of the document does provide details of 2 example methodologies that could be implemented for the determination of the significance of construction noise impacts; the “ABC Method” and the “5dB Change Method.
- 13.1.4 The specifics of the two assessment methods that could be used to derive appropriate construction noise limits for the works are detailed below.

#### *BS5228 Example Method 1 – The ABC Method*

- 13.1.5 The ABC method is based upon threshold noise levels defined by both time and existing ambient noise levels. The method requires the ambient pre construction noise level to be determined and rounded to the nearest 5dB. This ambient noise level is then compared to the total noise level which would contain noise associated with the construction operations. If the total noise level exceeds the appropriate category value then a significant effect is deemed to occur. The threshold/category values and definitions are presented within Table 13D.1 below:

**Table 13D.1 BS5228 Example Method 1 – ABC Method**

Assessment category and threshold value period (L <sub>Aeq</sub> )	Threshold value, in decibels (dB)		
	Category A <sup>A)</sup>	Category B <sup>B)</sup>	Category C <sup>C)</sup>
Night-time (23:00 – 07:00)	45	50	55
Evening and Weekends <sup>D)</sup>	55	60	65
Daytime (07:00 -19:00) and Saturdays (07:00 – 13:00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L<sub>Aeq</sub> noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total LAeq noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

- A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values
- B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values
- C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values
- D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

### *BS5228 Example Method 2 – 5 dB(A) Change*

- 13.1.6 The second method is the “5 dB (A) change” method. This is based upon the premise that a significant effect is deemed to occur if the total noise (pre construction ambient plus construction noise) exceeds the pre construction ambient noise by 5dB or more.
- 13.1.7 This method is detailed to be subject to lower cut-off values of 65dB, 55dB and 45dB LAeq,T from construction noise alone, for the daytime, evening and night-time periods respectively.
- 13.1.8 The criteria further requires that for a significant effect to occur the total noise level must exceed the pre construction ambient noise for a duration of one month or more, unless works of a shorter duration are likely to result in significant impacts.

## Appendix 13C – Sound Level Meter Calibration Certification

**Table 13C.1 – Noise Monitoring Survey Equipment Details**

Manufacturer	Model	Description	Serial Number
01dB	Solo	Class 1 Sound Level Meter	61331
	Solo	Class 1 Sound Level Meter	61332
Norsonic	1251	Acoustic Calibrator	31460
		Acoustic Calibrator	32704

The relevant calibration certificates for all the equipment listed above as applicable on the dates of the noise surveys are given on the following pages.



**CERTIFICAT DE CONFORMITE**  
**CONFORMITY CERTIFICATE**

Nous, fabricant  
*We, manufacturer*

**01dB-Metravib**  
200, Chemin des Ormeaux  
F 69578 LIMONEST Cedex- FRANCE

déclarons sous notre seule responsabilité que le produit suivant :  
*declare under our own responsibility that the following equipment :*

Désignation : **Sonomètre**  
*Designation : Sound-level meter*

Référence : BLUE SOLO 01  
*Reference :*

Numéro de série : 61331  
*Serial Number :*

est conforme aux dispositions des normes suivantes :  
*complies with the requirements of the following standards :*

	Norme Standard	Classe Class	Edition du Edition of
<b>Sonomètre :</b>	IEC 60651	1	10-2000
<b>Sound-level meter :</b>	IEC 60804	1	10-2000
	IEC 61672-1	1	05-2002
	IEC 1280	1	07-1995
	ANSI S1.11	1	
	ANSI S1.4		2001

et répond en tout point, après vérification et essais, aux exigences spécifiées, aux normes et règlements applicables, sauf exceptions, réserves ou dérogations énumérées dans la présente déclaration de conformité.

*After testing and verification, this device satisfies all specified requirements and applicable standards and regulations barring exceptions, reservations, or exemptions listed in this certificate of conformity.*

Date  
*Date*

Responsable Département Produits  
*Head of Products Department*

05/12/08

Laurent Faigel

**01dB-Metravib**

01dB-Metravib - 2000, Chemin des Ormeaux - F-69578 Limonest Cedex - France  
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déclarons sous notre seule responsabilité que le produit suivant :  
 declare under our own responsibility that the following equipment :

Désignation : **Sonomètre**  
 Designation : **Sound-level meter**

Référence : **BLUE SOLO 01**  
 Reference :

Numéro de série : **61332**  
 Serial Number :

est conforme aux dispositions des normes suivantes :  
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<b>Sonomètre :</b>	IEC 60651	1	10-2000
<b>Sound-level meter :</b>	IEC 60804	1	10-2000
	IEC 61672-1	1	05-2002
	IEC 1260	1	07-1995
	ANSI S1.11	1	
	ANSI S1.4		2001

et répond en tout point, après vérification et essais, aux exigences spécifiées, aux normes et règlements applicables, sauf exceptions, réserves ou dérogations énumérées dans la présente déclaration de conformité.

After testing and verification, this device satisfies all specified requirements and applicable standards and regulations barring exceptions, reservations, or exemptions listed in this certificate of conformity.

Date  
 Date

Responsable Département Produits  
 Head of Products Department

05/12/08

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Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)

Date of Issue: 12 July 2010

Certificate Number: AC/10/137/03

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APPROVED SIGNATURES	Caira Larrea ✓	Andy Moorhouse ✓
	Gary Phillips ✓	Danny McCree ✓




Acoustic Calibration Laboratory  
 The University of Salford  
 Salford, Greater Manchester M6 6PU

### CALIBRATION OF A SOUND CALIBRATOR

FOR: Mouchel  
 St John's House  
 Queen Street  
 Manchester  
 M2 5JB

FOR THE ATTENTION OF: William Neale

DESCRIPTION	Calibrator with housing for one inch microphones and adapter type 1243 for half-inch microphones
MANUFACTURER	Norsonic
TYPE	1251
SERIAL NUMBER	31460
DATE OF CALIBRATION:	12 July 2010
TEST PROCEDURE	CTP06 (Laboratory Manual)

Test Engineer (initial):  Name: Gary Phillips

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to national standards and to the units of measurement defined at the National Physical Laboratory or other associated national standards laboratories. This certificate may not be reproduced other than in full compliance with the terms and conditions specified in the issuing laboratory's terms and conditions.



**Norsonic**  
 Certificate of Calibration

Certificate No.: CAL 022-2010-2160



Test object : Sound Calibrator  
 Manufacturer: Norsonic  
 Type : 1251  
 Serial no: 32704

Customer:

	Level	Level Stability	Frequency	Frequency Stability	Distortion
Measurement Results:	114,01 dB	0,06 dB	1000,28 Hz	0,00 %	0,17 %
Expanded Uncertainty:	0.11 dB	0.02 dB	0.001 Hz	0.1 %	0.1 %

The stated level is relative to 20µPa.  
 The stated level is valid at reference conditions. The following correction factors have been applied during the measurement:  
 Pressure : 0,0005 dB/kPa Temperature : 0,000 dB/°C Relative humidity : 0,000 dB/%RH Load volume : 0,0003 dB/mm3  
 The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k, which for a t-distribution with the reported effective degree of freedom corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

Records : L:\PROJECTS\CALLAB\PROGRAM\Cal\2010\NOR1251\_32704\_M1.nmf  
 The distortion measurement is not accredited.

Environmental conditions: Pressure : Temperature : Relative humidity :  
 Reference conditions: 101,325 kPa 23,0 °C 50 %RH  
 Measurement conditions : 97,426 ± 0.010 kPa 23,8 ± 1.0 °C 46,0 ± 3.0 %RH

Date received for calibration :  
 Date of calibration: 2010-03-23  
 Date of issue: 2010-03-23  
 Engineer Terje Hansen  
 Supervisor



This certificate of calibration is issued by a laboratory accredited by Norwegian Accreditation (NA). NA is one of the signatories to the EA Multilateral Agreement for mutual recognition of calibration certificates (European Co-operation for Accreditation). The accreditation states that the laboratory meets the NA requirements concerning competence and calibration system for all the calibrations contained in the accreditation. It also states that the laboratory has a satisfactory quality assurance system and traceability to accredited or national calibration laboratories. This certificate may not be reproduced other than in full.

## Appendix 13D: Noise Monitoring Survey Results

DAY TIME (CRTN PERIOD) NOISE MONITORING SURVEYS																		
Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (hrs)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
MP01	Cranleigh Drive	Free-field, 1.5m above ground, on soft ground, soft ground between microphone and A6 carriageway. Approx. 75m to A6 carriageway.	Traffic noise from A6 predominates. Birdsong in adjacent hedges and wind thru' foliage.	Dry, roads dry, sunny with high clouds (~30% cover). 54% humidity. Wind Ave 2m/s, gusts to 3m/s. 14C.	17/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1349	51.7	53.4	46.3	76.4	114.0	113.9	Trains, some planes overhead, though airport movements not heard.
MP02	Opposite no 12 Old Mill Lane	Free-field, 1.5m high, on soft ground with soft ground around. 12m to façade of 12 OML.	Distant road traffic noise on A6 and A523. Birdsong. Wind rustling foliage – many trees around MP.	Warm, high cloud cover (~90% cover). Roads dry. Wind ave 1.0m/s, gusts to 1.7m/s. 18C. 71% humidity.	22/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1402	45.9	47.5	38.7	68.5	113.9	113.8	Generally a very quiet location. Trains, pedestrians using footpath. High aircraft overhead.
MP03	Between 12 and 19 Sheldon Road	Free-field, 1.5m high, on hard ground, predominantly soft ground around. 15m to facades.	Birdsong in adjacent hedgerows. Distant flowing traffic on A523 London Rd Nth and B5143 Dean Lane.	Warm and sunny, no cloud, negligible wind, 17C / 41% humidity.	12/10/10	01dB Solo	61331	Norsonic 1251	31460	3	1355	46.4	50.0	39.4	64.6	113.9	113.8	Tranquil location. Frequent high flying jets, though not very intrusive.
MP04	Mill Hill Hollow	Free-field, 1.5m high, on soft ground, predominantly soft ground around.	BG is distant traffic noise on A523 London Rd Nth and also on Woodford Rd. More dominant noise source is overflying passenger jets every ~5mins and birdsong in	Cool, clear and sharp autumn day. Negligible wind, 9C, 68% humidity, 20% high cloud cover.	13/10/10	01dB Solo	61331	Norsonic 1251	31460	3	1031	54.5	50.3	35.6	86.9	113.9	113.8	Few local cars. Frequent overflying jet aircraft from Manchester airport.

DAY TIME (CRTN PERIOD) NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (hrs)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
			trees/hedgerow															
MP05	Woodford Road	1.5m high, free-field, predominantly soft ground around, no significant barriers in area. In line of hedgerow at a gap in the hedge ~3m to carriageway edge.	Dominated by road traffic on Woodford Road. Some aircraft movements incl take-off/landing "rumble". Little else heard.	Dry, roads dry. Light winds – average 0.6m/s, temp 11C, humidity 76%. Light, high cloud ~70% cover.	01/11/10	01dB Solo	61331	Norsonic 1251	32704	3	1401	67.0	71.9	49.3	82.2	113.8	113.9	6 trains passed over 3 hour period.
MP06	Opposite no 173 Chester Road	1.5m high, free-field, on soft ground (verge) with soft ground to N and hard ground to S. ~4m to carriageway edge.	Constant road traffic on Chester Road is dominant source, including numerous HGVs.	Roads dry (after morning rain), sunny intervals, wind ave 0.6m/s. 17C, 57% humidity. ~50% cloud cover.	16/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1400	74.6	77.5	65.8	90.0	113.9	113.9	Many vehicles turning into/out of Woodford Road.
MP07	Albany Road – between nos 83 and 86 and adjacent to field.	1.5m high, free-field, 20m to nearest façade. Soft ground to S and E. Fence / hedgeline broken at MP giving line of sight to golf course.	Constant BG is traffic noise from Woodford Rd, A555 and Chester Rd. Frequent overflying aircraft going in to land at Manc airport (~every 5 minutes).	Winds – gusty, typically 1.5m/s ave with max upto 4m/s (from S). 14C 57% humidity. Roads initially dry then wet 1323 onwards.	06/10/10	01dB Solo	61331	Norsonic 1251	31460	3	1022	52.9	54.6	49.9	65.9	113.9	113.8	Paused for rain 1239 to 1323. Some local noise – particularly from Queens Gate primary school (playground to rear).
MP08	Dairy House Lane	1.5m high, on soft ground with soft ground around. 20m to carriageway edge of A555. Position elevated relative to A555 carriageway by ~10m.	Road traffic noise on A555 dominates noise climate including numerous HGVs.	Sunny with high cloud (~40% cover). Wind ave 1.4m/s with gusts to 2m/s. 13C humidity 50%. Road surfaces dry.	17/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1028	70.2	73.0	63.5	81.0	113.9	113.8	Also numerous local vehicles on Dairy House Lane – used as short cut through to Handforth shopping

DAY TIME (CRTN PERIOD) NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (hrs)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
																		centre.
MP09	10 Swettenham Road	1.5m high. On hard ground. Free-field. ~5m to nearest façade, A555 elevated in relation to MP.	Road traffic noise from A555 and jet engine noise from Manc airport (on ground and overhead) are dominant sources	Rain until 1030hrs, roads dry ~1100 onwards. Cloud at start, to clearer at end. Wind ave 0.5m/s, temp 15C, humidity 58%.	16/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1030	54.4	56.5	49.7	71.3	113.9	113.9	Some local traffic on Pickmere Road.
MP10	Clay Lane	On soft ground. Mix of hard/soft ground around. 1.5m high. Free-field.	BG is distant traffic on Wilmslow Rd/A555, Also louder/less frequent local vehicles on Clay Lane / Wallingford Rd. Plus engine noises from aircraft.	High cloud ~80% cover. Roads dry. Wind ave 1.0m/s. 19C, 58% humidity.	21/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1405	53.2	56.5	41.5	79.2	113.9	113.8	Aircraft noise mostly thrust noises from engines as vehicles slow to come in to land.
MP11	Bolshaw Farm Lane	On waste ground atop a grassy bank. 1.5m high. 2.5m above road surface, on soft ground. Free-field.	BG is vehicles on B538 & Bolshaw Lane. Also frequent aircraft.	16C 58% humidity. Breezy – ave wind speed 2.5m/s, gusts to 4m/s. Dry. High clouds, generally 50% cover.	05/10/10	01dB Solo	61331	Norsonic 1251	31460	3	1356	49.0	50.5	43.6	70.3	113.9	113.9	Aircraft noise loud – taxi-ing, take off and landing.
MP12	Styal Road	On soft ground, predom soft ground around.	Road traffic on Styal road and aircraft movements at airport.	Dry, 11.5C, 80% cloud cover, negligible wind.	06/10/10	01dB Solo	61332	Norsonic 1251		3	0952	67.1	70.9	55.9	79.3	113.9	114.0	Roads initially damp then drying.

DAY TIME (CRTN PERIOD) NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (hrs)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
MP13	Tedder Drive	Free-field.	Road traffic on Ringway / Styal Rd. Manchester Airport – constant taxiing of aircraft.	Dry. 15C. 60% cloud.	06/10/10	01dB Solo	61332	Norsonic 1251		3	1318	58.8	60.9	52.3	78.0	114.0	113.8	5 trains noted during measurement period,
MP14	Carsdale Road	1.5m high. Free-field. On soft ground with soft ground around, ~6m to Carsdale Rd, ~15m to Ringway Rd.	BG is traffic noise on Ringway Rd. Virtually constant aircraft engine noise from taxiing aircraft.	Roads dry. V high wispy cloud ~20% cover. Warm and sunny 0.8m/s ave winds. 19C 58% humidity,	22/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1016	63.2	62.7	54.6	85.0	113.9	113.9	Position very close to flight path for landing planes.
MP15	Felskirk Road / Thaxted Walk	On soft ground with soft ground to Ringway Road and airport beyond. 1.5m high. Free-field position.	Dominated by aircraft movements at Manchester Airport. Constant engine noise from taxiing aircraft as well as take-off, landing and airborne.	19C 63% humidity. High/light cloud (~30% cover) with sunny spells. 1.4m/s ave wind speeds. Roads dry.	21/09/10	01dB Solo	61331	Norsonic 1251	31460	3	1031	58.3	59.4	48.2	78.8	113.9	113.8	Road traffic noise from M56 and Ringway Rd only heard in any lulls in aircraft taxiing noise (not often).

NIGHT TIME NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (mins)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
MP01	Cranleigh Drive	As per daytime CRTN measurement	Traffic on A6 (42 vehicles) incl HGVs	20C 58% humidity, overcast, no wind	19/06/13	01dB Solo	61332	Norsonic 1251	31460	00:30	0241	37.4	38.7	22.8	56.5	114.0	114.0	1 x distant jet heard
MP02	Old Mill Lane	At junction of Old Mill Lane and Mill Lane	Distant (infrequent) traffic on A6. Birdsong, very distant plane noise.	20C 67% humidity, overcast, still.	19/06/13	01dB Solo	61332	Norsonic 1251	31460	00:30	0159	28.6	28.6	19.4	56.0	114.0	114.0	Noisy birds, horse in field, 2 distant planes and 1 train.
MP03	Sheldon Road	At junction Sheldon Rd and Longnor Rd	Distant traffic noise on A523 and A5143. Distant aircraft noise. Sound of flowing water in drain or supply.	19C 63% humidity, overcast, no wind.	19/06/13	01dB Solo	61332	Norsonic 1251	31460	00:30	0121	32.0	35.9	22.9	43.8	114.0	114.0	2 x aircraft. Barking dog,
MP04	Mill Hill Hollow	As per daytime CRTN measurement	Birdsong/calls and animal noises. Occasional distant traffic on Woodford Rd and A523.	14C 48% humidity, 70% cloud cover, no wind.	26/06/13	01dB Solo	61331	Norsonic 1251	31462	00:30	0304	30.6	33.0	25.7	49.6	114.0	114.0	1 x aircraft. Loud peacock calls.
MP05	Woodford Road	As per daytime CRTN measurement	Distant industrial noise (pumps or similar) at oil depot. Distant plane noise. 8 vehicles passed on Woodford Rd.	19C 66% humidity, overcast, still.	19/06/13	01dB Solo	61332	Norsonic 1251	31460	00:30	0040	54.2	41.4	30.4	78.2	114.0	114.0	5 x planes. HGV movements at oil depot.
MP06	Opposite no 173 Chester Road	As per daytime CRTN measurement	Frequent vehicles on A5149 Chester Rd (51 in period). In lulls in flow industrial noise from oil depot and	20C 70% humidity, overcast, no wind.	19/06/13	01dB Solo	61332	Norsonic 1251	31460	00:30	0001	61.4	64.9	34.7	77.8	114.0	114.0	HGV left oil depot but did not pass MP.

NIGHT TIME NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (mins)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
			birdsong could be heard.															
MP07	Albany Road – between nos 83 and 86 and adjacent to field.	As per daytime CRTN measurement	Distant vehicles on A555/A5102. Distant industrial noise from oil depot on Woodford Rd. Birds/animals.	16C 55% humidity. No wind, 90% cloud cover.	26/06/13	01dB Solo	61331	Norsonic 1251	31462	00:30	0124	33.3	36.3	25.8	53.0	114.0	114.0	Dog bark, seagulls, 2 x distant planes. 1 x distant freight train.
MP08	Dairy House Lane	As per daytime CRTN measurement	Vehicles on A555 and A34. Industrial (fan?) noise heard to west of MP in direction of 'Fitness First'/industrial units. Birdsong/calls.	15C 62% humidity. No wind. 90% cloud cover.	26/06/13	01dB Solo	61331	Norsonic 1251	31462	00:30	0043	56.9	59.5	37.3	76.9	114.0	114.0	2 distant planes heard,
MP09	10 Swettenham Road	As per daytime CRTN measurement	Vehicles on A555. Aircraft.	15C 60% humidity. No wind, 100% cloud cover.	26/06/13	01dB Solo	61331	Norsonic 1251	31462	00:30	0002	41.6	44.5	27.8	61.4	113.6	113.6	3 planes heard.
MP10	Clay Lane	As per daytime CRTN measurement	Dawn chorus began	17C	19/06/13	01dB Solo	61331	Norsonic 1251		00:30	0308	34.0	36.2	29.8	47.6	113.9		Dawn chorus began
MP11	Bolshaw Farm Lane	As per daytime CRTN measurement	Distant fan – ventilation at farm?		19/06/13	01dB Solo	61331	Norsonic 1251		00:30	0229	40.6	38.0	29.2	59.6	113.9		2 x jet aircraft
MP12	Styal Road	As per daytime CRTN measurement		17C. Negligible breeze	19/06/13	01dB Solo	61331	Norsonic 1251		00:30	0146	59.4	63.8	40.2	75.0	113.9		Helicopter, noisy exhaust, motorbike.

NIGHT TIME NOISE MONITORING SURVEYS

Site ID	Site Location	Site Description	Noise Climate	Meteorological Conditions	Date	Sound Level Meter		Calibrator		Measurement Duration (mins)	Time	Overall Level				Calibration (dB(A))		Comments
						Model	Serial Number	Model	Serial Number			dB L <sub>Aeq</sub>	dB L <sub>A10</sub>	dB L <sub>A90</sub>	dB L <sub>AMAX</sub>	At Start	At End	
MP13	Tedder Drive	As per daytime CRTN measurement	Distant road noise, local buses, occasional landing planes	Wind speed 0.4m/s, 19.6C, 59% humidity	19/06/13	01dB Solo	61331	Norsonic 1251		00:30	0025	66.5	57.9	39.7	85.8	113.9		6 x jets, HGV/plant noise heard from airport site
MP14	Carsdale Road	As per daytime CRTN measurement		17C negligible breeze	19/06/13	01dB Solo	61331	Norsonic 1251		00:30	0106	56.9	58.7	42.1	73.2	113.9		5 x jets
MP15	Felskirk Road / Thaxted Walk	As per daytime CRTN measurement	Vehicle and aircraft (taxiing) movements at Manchester Airport. Distant vehicle noise on Ringway/M56.	13C 61%. 80% cloud cover. No wind.	26/06/13	01dB Solo	61331	Norsonic 1251	31462	00:30	0214	42.6	43.6	37.3	65.7	114.0	114.0	1 x local vehicle (cause of the LAMax)



## Appendix 13E: BNL Calculations

Road Name	Predicted BNL, $L_{A10, 18hr}$ , dB(A)				Change in Noise Level			Dwelling Count
	DM2017	DS2017	DM2032	DS2032	Short Term	Long Term	DM/DM	
M56 J5 SB On Slip	70.6	70.2	69.6	69.6	-0.4	-1.0	-1.0	0
Thorley Lane	64.5	65.6	66.2	67.1	1.1	2.6	1.7	0
Thorley Lane	63.2	64.7	64.5	65.9	1.5	2.7	1.3	0
M56 J5 NB Exit Slip	73.6	75.1	74.5	75.8	1.5	2.2	0.9	0
M56 J5 SB On Slip	76.5	77.1	77.4	77.0	0.6	0.5	0.9	0
M56 J5 NB Exit Slip	77.3	78.2	78.0	78.9	0.9	1.6	0.7	0
M60	73.4	72.3	72.9	72.9	-1.1	-0.5	-0.5	0
M56 J5 SB On Slip	66.8	68.2	68.6	68.6	1.4	1.8	1.8	0
M56 J5 NB Exit Slip	71.2	72.9	71.8	73.7	1.7	2.5	0.6	0
St. Petersgate	63.6	63.7	63.6	63.2	0.1	-0.4	0.0	1
Wellington Road South	68.8	67.7	69.2	68.2	-1.1	-0.6	0.4	1
A5102 Adlington Road	66.4	65.4	67.2	65.5	-1.0	-0.9	0.8	1
Wellington Road South	70.5	69.6	70.8	70.0	-0.9	-0.5	0.3	1
Wellington Road South	68.9	67.7	69.2	68.2	-1.2	-0.7	0.3	2
Wellington Road South	71.1	70.5	71.3	71.0	-0.6	-0.1	0.2	2
Thorley Lane	65.4	66.5	67.2	68.1	1.1	2.7	1.8	2
Thorley Lane	64.7	65.8	66.5	67.4	1.1	2.7	1.8	2
Thorley Lane	63.8	65.3	65.3	66.6	1.5	2.8	1.5	2
Wellington Road South	70.7	69.7	70.9	70.2	-1.0	-0.5	0.2	3
A5102 Woodford Road	67.2	66.0	68.9	67.6	-1.2	0.4	1.7	3
A5102 Woodford Road	68.6	67.5	70.3	69.2	-1.1	0.6	1.7	3
Longshut Lane	70.9	70.0	72.8	71.7	-0.9	0.8	1.9	4
Wellington Road South	69.8	68.6	70.3	69.3	-1.2	-0.5	0.5	4
Mill Lane	62.8	60.8	64.5	61.7	-2.0	-1.1	1.7	4
Wellington Road South	72.7	72.1	72.9	72.4	-0.6	-0.3	0.2	5
Buxton Road	72.5	69.7	72.6	70.3	-2.8	-2.2	0.1	6
A5102 Woodford Road	67.5	66.5	68.5	67.1	-1.0	-0.4	1.0	6
A5102 Hough Lane	63.9	62.8	65.4	64.6	-1.1	0.7	1.5	6
Wellington Road South	70.7	69.9	71.0	70.1	-0.8	-0.6	0.3	7
A5102 Adlington Road	65.8	63.3	67.4	64.8	-2.5	-1.0	1.6	7
A5102 Adlington Road	66.7	64.0	68.2	65.5	-2.7	-1.2	1.5	7
Mill Lane	62.8	60.6	64.6	61.5	-2.2	-1.3	1.8	7
Wellington Road South	70.5	69.6	70.7	70.0	-0.9	-0.5	0.2	8
Buxton Road	71.0	69.0	71.2	69.4	-2.0	-1.6	0.2	9
A538 Prestbury Road	70.0	69.1	71.3	70.7	-0.9	0.7	1.3	9
A5102 Adlington Road	67.3	64.7	68.8	66.3	-2.6	-1.0	1.5	10
Werneth Road	56.5	55.3	58.2	56.9	-1.2	0.4	1.7	10
Lomond Road	56.8	55.0	58.0	57.1	-1.8	0.3	1.2	10
Middlewood Road	60.0	58.0	60.7	58.7	-2.0	-1.3	0.7	10

Road Name	Predicted BNL, $L_{A10, 18hr}$ , dB(A)				Change in Noise Level			Dwelling Count
	DM2017	DS2017	DM2032	DS2032	Short Term	Long Term	DM/DM	
Simonsway	64.1	63.1	64.3	63.9	-1.0	-0.2	0.2	11
A5102 Woodford Road	68.5	67.4	70.3	69.1	-1.1	0.6	1.8	11
A5102 Woodford Road	68.8	68.0	70.5	69.6	-0.8	0.8	1.7	13
Buxton Road	71.1	69.0	71.2	69.4	-2.1	-1.7	0.1	14
Oatlands Road	64.4	63.3	65.4	64.4	-1.1	0.0	1.0	19
Brookledge Lane	62.1	60.5	64.3	62.4	-1.6	0.3	2.2	20
Finney Lane	67.2	66.3	67.6	66.6	-0.9	-0.6	0.4	21
Buxton Road	70.8	68.5	71.0	69.0	-2.3	-1.8	0.2	22
Park Lane	60.3	59.2	60.9	59.2	-1.1	-1.1	0.6	22
Brookledge Lane	60.5	58.5	63.0	60.4	-2.0	-0.1	2.5	22
Wellington Street	62.6	63.5	63.4	63.9	0.9	1.3	0.8	25
Buxton Road	71.4	69.4	71.5	69.6	-2.0	-1.8	0.1	25
Lynton Road	54.2	55.8	53.6	55.0	1.6	0.8	-0.6	26
Hillcrest Road	60.7	61.6	60.8	61.4	0.9	0.7	0.1	27
Greenwood Road	61.8	60.5	62.5	61.6	-1.3	-0.2	0.7	33
Stanneylands Road	62.2	59.8	62.7	59.0	-2.4	-3.2	0.5	33
A5102 Adlington Road	67.3	64.7	68.8	66.3	-2.6	-1.0	1.5	33
Stanneylands Road	61.6	59.2	62.9	58.5	-2.4	-3.1	1.3	34
A5102 Adlington Road	67.2	64.9	68.5	66.2	-2.3	-1.0	1.3	35
Greenbrow Road	63.8	63.3	64.1	63.9	-0.5	0.1	0.3	41
Buxton Road	70.4	67.9	70.5	68.2	-2.5	-2.2	0.1	42
Buxton Road	70.9	68.3	71.0	68.7	-2.6	-2.2	0.1	42
Chatham Street	62.9	62.3	63.6	63.1	-0.6	0.2	0.7	44
Buxton Road	71.0	68.9	71.1	68.9	-2.1	-2.1	0.1	45
Werneth Road	57.5	56.4	59.0	57.9	-1.1	0.4	1.5	45
Chatham Street	62.9	62.3	63.6	63.1	-0.6	0.2	0.7	47
Cliff Road / Chancel Lane	60.7	58.7	62.8	61.7	-2.0	1.0	2.1	49
Station Road	61.6	59.6	62.3	60.4	-2.0	-1.2	0.7	52
New Bridge Lane	62.8	61.8	64.8	64.4	-1.0	1.6	2.0	53
Buxton Road	72.6	70.8	72.8	71.0	-1.8	-1.6	0.2	55
Lisburne Lane	62.5	61.1	63.8	62.1	-1.4	-0.4	1.3	59
Finney Lane	66.7	65.6	66.8	65.9	-1.1	-0.8	0.1	71
Hillcrest Road	60.5	61.3	60.5	61.1	0.8	0.6	0.0	72
B5095 Hulme Hall Road	64.0	63.0	64.7	64.0	-1.0	0.0	0.7	73
Chatham Street	62.9	62.3	63.6	63.1	-0.6	0.2	0.7	88
B5095 Hulme Hall Road	63.3	62.5	63.9	63.4	-0.8	0.1	0.6	89
Lisburne Lane	61.5	60.6	62.3	61.6	-0.9	0.1	0.8	90
Dean Row Road	62.8	61.9	62.8	62.1	-0.9	-0.7	0.0	96
Waterloo Road	56.7	55.4	57.9	56.6	-1.3	-0.1	1.2	98
New Road / Prestbury Lane / Heybridge Lane	60.8	59.6	63.9	62.9	-1.2	2.1	3.1	104
A560 Altrincham Road /	63.6	62.5	64.9	63.7	-1.1	0.1	1.3	106

Road Name	Predicted BNL, L <sub>A10, 18hr</sub> , dB(A)				Change in Noise Level			Dwelling Count
	DM2017	DS2017	DM2032	DS2032	Short Term	Long Term	DM/DM	
Northenden Road								
Adswold Lane East	61.7	62.6	62.0	62.6	0.9	0.9	0.3	119
Woodhouse Lane	63.5	64.2	64.0	64.4	0.7	0.9	0.5	119
Gladeside Road	57.1	56.3	58.7	58.7	-0.8	1.6	1.6	122
Lowfield Road	62.2	59.8	63.4	61.6	-2.4	-0.6	1.2	128
Gladeside Road	61.6	60.6	62.3	62.0	-1.0	0.4	0.7	130
Buxton Road	71.3	69.2	71.5	69.6	-2.1	-1.7	0.2	135
Hollyhedge Road	63.5	64.4	64.2	65.1	0.9	1.6	0.7	136
Park Lane	60.7	59.6	61.2	59.6	-1.1	-1.1	0.5	169
Greenwood Road	58.4	58.1	59.1	57.3	-0.3	-1.1	0.7	204
Chatham Street	62.9	62.3	63.6	63.1	-0.6	0.2	0.7	213
Chatham Street	62.9	62.3	63.6	63.1	-0.6	0.2	0.7	239
Portway	64.4	64.0	64.7	64.2	-0.4	-0.2	0.3	270