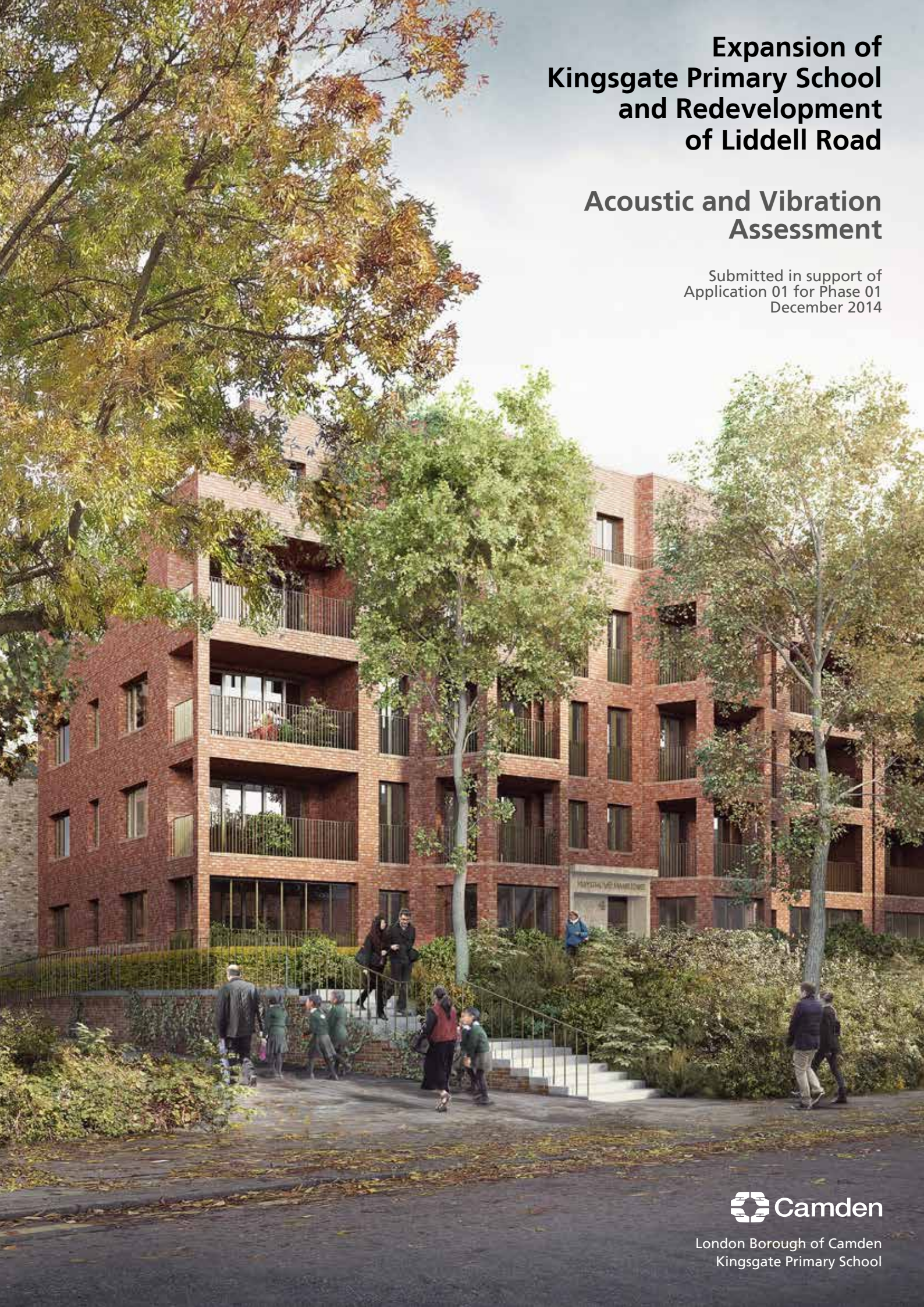

Expansion of Kingsgate Primary School and Redevelopment of Liddell Road

Acoustic and Vibration Assessment

Submitted in support of
Application 01 for Phase 01
December 2014

Camden

London Borough of Camden
Kingsgate Primary School

GILLIERON SCOTT
ACOUSTIC DESIGN

Report No. Liddell Road – Phase 1 Acoustic Report.doc

For: London Borough of Camden

Application 01

Expansion of Kingsgate Primary School & Redevelopment of Liddell Road – Phase 1

ENVIRONMENTAL NOISE AND VIBRATION REPORT

Compiled by ..... Tim Scott BSc MIOA Date: 28/11/2014

Checked by: ..... Paul Gillieron BSc MIOA Date: 28/11/2014

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1.0 INTRODUCTION

As a part of the acoustic design of the proposed development at Liddell Road, Camden, London, Gillieron Scott Acoustic Design (GSAD) have been commissioned to undertake a noise and vibration assessment and if required specify appropriate noise and vibration mitigation to achieve suitable internal noise levels to satisfy building control and local Camden council noise criteria.

It is proposed that the site will be constructed in two phases. The first phase will be the construction of Kingsgate Primary School and the enabling works for phase two. Phase two will comprise of two residential buildings and one commercial building. The site currently contains numerous commercial buildings which will be demolished to make way for the new development.

This report discusses the acoustic noise and vibration implications for Kingsgate Primary School, a separate report has been issued for Phase 2.

There is a railway on the northern boundary of the site which dominates the existing noise environment. Train passes are frequent; approximately 2-3 every five minutes during the day, in addition freight trains pass on the tracks nearest to the boundary approximately every 2 hours.

Maygrove Road lies to the south and has light traffic flow during the day.

The new Kingsgate Primary School will be located in the North East section of the site adjacent to the railway line.

The Building Bulletin 93 (BB93) was designed by educators, architects and acousticians to overcome problems of reverberation, communication, intelligibility, background noise from traffic and ventilation systems, and privacy in new buildings.

Its recommendations, to which the proposed school will be designed, will guarantee high standards.

The loudest half an hour on site at the boundary with the railway line to the North (position A) during a typical school day was measured to be 80dB $L_{Aeq,30min}$. These measurements have been carried out during a typical school day period and the noise affecting the site is dominated by the railway line to the North. As a result a noise barrier to be constructed to 1st floor level along the northern boundary to the railway has been recommended to reduce noise levels from the railway in the external amenity areas of the school.

Nearby traffic and aircraft noise were also contributing to the overall noise levels.

Due to BB93 internal noise level limits, unsilenced natural ventilation via opening windows is not possible. Therefore a mechanical and/or silenced passive ventilation strategy will be used to meet air requirements for all areas. Windows will still be open able to provide access for maintenance and additional ventilation at the teachers' discretion. Internal noise levels will thus comply with BB93.

The environmental noise impact from the outdoor playground to the closest existing residential properties from the proposed school will be minimal due to the high levels of existing noise levels on site from the railway.

Maximum noise levels within the school are expected to occur in the multi-purpose hall when it is used for a music recital/school discos with noise levels expected to be up to 95dB LAeq on occasion. The hall is to be used by the school and although its hours of operations have not yet been defined they have been considered in this report to be 8am for breakfast club to 11pm as a worst case.

The noise survey has been used to determine the sound insulation requirement of the school in order to limit the ambient noise level from the exterior to within the limits prescribed in BB93.
Total plant noise level with all plant operating shall be at least 5dB(A) below minimum background LA90 level 1m from the façade of any nearby occupied dwelling, during operating hours of the school. This limit will be used in all attenuator calculations.

This report has been prepared for the London Borough of Camden by Tim Scott of GSAD.

A detailed glossary of terminology used in this report, is provided in the Appendix.

2.0 LOCAL AUTHORITY POLICY AND GUIDANCE

2.1 Acoustic Design Criteria

Local authority planning policy and typical design standards as detailed below have been used as deign guidance for the recommendations contained within this report. Some of the limits contained within the Camden's noise and vibration policy relate solely to residential dwellings but have been included as a guide for Phase 1.

2.1.1 Camden Council Noise and Vibration Policy

Noise and vibration can have a major effect on amenity and health and therefore quality of life. Camden's high density and mixed-use nature means that disturbance from noise and vibration is a particularly important issue in the borough. Camden's Core Strategy recognises the importance of this issue for Camden's residents and policy DP28 contributes to implementing a number of Core Strategy policies, including CS5 - *Managing the impact of growth and development,* CS9 - *Achieving a successful Central London*, CS11 - *Promoting sustainable and efficient travel* and CS16 - *Improving Camden's health and well-being*.

Policy DP28 - Noise and Vibration

The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:

a. development likely to generate noise pollution; or
b. development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted.
The Council will only grant permission for plant or machinery if it can be operated without cause harm to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact.

The effect of noise and vibration can be minimised by separating uses sensitive to noise from development that generates noise and by taking measures to reduce any impact. Noise sensitive development includes housing, schools and hospitals as well as offices, workshops and open spaces, while noise is generated by rail, road and air traffic, industry, entertainment (e.g. nightclubs, restaurants and bars) and other uses.

The Council will only grant planning permission for development sensitive to noise in locations that experience noise pollution, and for development likely to generate noise pollution, if appropriate attenuation measures are taken, such as double-glazing. Planning permission will not be granted for development sensitive to noise in locations that have unacceptable levels of noise.

Where uses sensitive to noise are proposed close to an existing source of noise or when development that generates noise is proposed, the Council will require an acoustic report to ensure compliance with PPG24: *Planning and noise*. A condition will be imposed to require that the plant and equipment which

may be a source of noise pollution is kept working efficiently and within the required noise limits and time restrictions.

Conditions may also be imposed to ensure that attenuation measures are kept in place and effective throughout the life of the development.

In assessing applications, we will have regard to the Noise and Vibration Thresholds, set out below. These represent an interpretation of the standards in PPG24 and includes an evening period in addition to the day and night standards contained in the PPG24, which provide a greater degree of control over noise and vibration during a period when noise is often an issue in the borough.

Table A: Noise levels on residential sites adjoining railways and roads at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	74 dB LAeq'12h	72 dB LAeq'12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	74 dB LAeq'4h	72 dB LAeq'4h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	66 dB LAeq'8h	66 dB LAeq'8h

Table B: Noise levels on residential streets adjoining railways and roads at and above which attenuation measures will be required

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	65 dB LAeq'12h	62 dB LAeq'12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	60 dB LAeq'^{4}h	57 dB LAeq'^{4}h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	55 dB LAeq'1h	52 dB LAeq'1h
Individual noise events several times an hour	Night	2300-0700	>82dB LAmax (S time weighting)	>82dB LAmax (S time weighting)

Table C: Vibration levels on residential sites adjoining railways and roads at which planning permission will not be granted

Vibration description and location of measurement	Period	Time	Vibration levels
Vibration inside critical areas such as a hospital operating theatre	Day, evening and night	0000-2400	0.1 VDV $ms^{-1.75}$
Vibration inside dwellings	Day and evening	0700-2300	0.2 to 0.4 VDV $ms^{-1.75}$
Vibration inside dwellings	Night	2300-0700	0.13 VDV $ms^{-1.75}$
Vibration inside offices	Day, evening and night	0000-2400	0.4 VDV $ms^{-1.75}$
Vibration inside workshops	Day, evening and night	0000-2400	0.8 VDV $ms^{-1.75}$

Where dwellings may be affected by ground-borne regenerated noise internally from, for example, railways or underground trains within tunnels, noise levels within the rooms should not be greater than 35dB(A)max.

Table D: Noise levels from places of entertainment on adjoining residential sites at which planning permission will not be granted

Noise description and measurement location	Period	Time	Sites adjoining places of entertainment
Noise at 1 metre external to a sensitive façade	Day and evening	0700-2300	LAeq, 5m shall not increase by more than 5dB*
Noise at 1 metre external to a sensitive façade	Night	2300-0700	LAeq, 5m shall not increase by more than 3dB*
Noise inside any living room of any noise sensitive premises, with the windows open or closed	Night	2300-0700	LAeq, 5m (in the 63Hz Octave band measured using the 'fast' time constant) should show no increase in dB*

* As compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dB$_{LAeq}$

Key references / evidence

- Camden's Noise Strategy, 2002
- The London Plan (Consolidated with Alterations since 2004), 2008
- Planning Policy Guidance 24: Planning and noise

2.1.2 Applicable Standards

2.1.3 Building Bulletin 93 (BB93) 'The Acoustic Design of Schools'

The school will be designed to fully comply with all the acoustic design targets as set out in Building Bulletin 93 'The Acoustic Design of Schools', produced by DfES." A summary of requirements is given below. For the full regulation visit the link below;

http://webarchive.nationalarchives.gov.uk/20130401151715/https:/www.education.gov.uk/publications/eOrderingDownload/BB93-Acoustic_Design.pdf

2.1.4 Summary of Building Bulletin 93 'The Acoustic Design Of Schools' (taken from BB93)

Building Bulletin 93 'The Acoustic Design of Schools' also known as BB93, is published by the Department for Education (DfE) and is a direct replacement for Part A of Building Bulletin 87 'Guidelines for environmental design in schools'.

Section 1 of BB93 is intended for designers and Building Control Bodies. It gives the performance targets for compliance with Requirement E4 from Part E of The Building Regulations.
Between March and May 2014, The Department for Education ran a consultation seeking views on draft acoustic performance standards for schools which will replace those given in Building Bulletin 93.

The standards ensure schools comply with the acoustic requirements of the following regulations:

The Building Regulations
The School Premises Regulations 2012
The Independent Schools Standards 2013

Feedback from the consultation is awaited.

2.1.5 Choosing a site (taken from BB93)

The acoustic design of a school starts with the selection of the site, a noise survey of the site and planning the layout of the school buildings.

Economic sites for new schools with easy access to transport often suffer from traffic noise and pollution. In the past, schools have sometimes been built on sites which would not normally have been considered suitable for housing. This has been in part because schools have not always been recognised as requiring particularly high environmental standards, and in part because there has been less formal control or regulation of noise levels in schools than for housing.

Where school sites are adjacent to busy roads they will require the use of intelligent design, zoning, noise screening and, if necessary, sound insulating building envelopes together with mechanical ventilation or acoustically designed passive ventilation. Many of the acoustic problems in existing schools derive directly from the school's location in a noisy area.

For existing schools, noise from road traffic is a common problem, but in some areas noise from railways and aircraft is intrusive [1]. Noise from industrial and leisure sources is a less frequent problem and can normally be dealt with at source by the Local Authority using their powers under the Environmental Pollution Act.

2.2 Recommendations for external noise levels outside school buildings (taken from BB93)

Although Requirement E4 does not apply to external noise, the following recommendations are considered good practice for providing good acoustic conditions outside school buildings.
For new schools, 60 dB $L_{Aeq,30min}$ should be regarded as an upper limit for external noise at the boundary of external premises used for formal and informal outdoor teaching, and recreational areas.
Under some circumstances it is possible to meet the specified indoor ambient noise levels on sites where external noise levels are as high as 70 dB $L_{Aeq,30min}$ but this will require considerable building envelope sound insulation, screening or barriers.
Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB$L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$. If this is not possible due to a lack of suitably quiet sites, acoustic screening should be used to reduce noise levels in these areas as much as practicable, and an assessment of predicted noise levels and of options for reducing these should be carried out.
Playgrounds, outdoor recreation areas and playing fields are generally considered to be of relatively low sensitivity to noise, and indeed playing fields may be used as buffer zones to separate school buildings from busy roads where necessary.
However, where used for teaching, for example sports lessons, outdoor ambient noise levels have a significant impact on communication in an environment which is already acoustically less favourable than most classrooms. Ideally, noise levels on unoccupied playing fields used for teaching sport should not exceed 50 dB $L_{Aeq,30min}$. If this is not possible at all locations, there should be at least one area at which noise levels are below 50 dB $L_{Aeq,30min}$ so that some outdoor teaching is possible.
Acoustic screening from fences, walls or buildings may be used to protect playgrounds from noise. At positions near the screen, traffic noise can be reduced by up to 10 dB(A).
All external noise levels in this section apply to measurements made at approximately head height and at least 3 m from any reflecting surface other than the ground.

<u>Vibration from nearby Railways</u>

Railways, plant and heavy vehicles close to a school can lead to vibration within the school buildings. This vibration can reradiate as audible noise, even when the vibration itself is not perceptible as shaking in the

building. The propagation of vibration depends on ground conditions but in general when planning a new school building it is advisable for the noise survey to include vibration measurements when there is a railway within 30 m of a building, or a road with significant HGV traffic within 20 m. In these cases airborne noise is also likely to be a problem.

Table F below shows upper limits for indoor ambient noise levels taken from BB93 'Acoustic Design for Schools'.

Table F: Upper limits for indoor ambient noise levels

Room	Indoor Ambient Noise Level $L_{Aeq,30mins}$
Teaching	35
Open Plan Teaching	40
Assembly Hall	35
Resource Areas	40
Kitchen *	50
Office *	40

** Part E of Schedule 1 to the Building Regulations 2000 (as amended by SI 2002/2871) applies to teaching and learning spaces and is not intended to cover administration and ancillary spaces (see under Scope in the Introduction). For these areas the performance standards are for guidance only.*

1/ Research indicates that teaching can be disrupted by individual noisy events such as aircraft flyovers, even where the noise level is below the limits in Table 1.1. For rooms identified in Table 1.1 having limits of 35 dB or less the noise level should not regularly exceed 55 dB $L_{A1,30min}$.

2/ Acoustic considerations of open-plan areas are complex and are discussed in Section 1.1.7 and Section 4.

3/ Studios require specialised acoustic environments and the noise limits for these will vary with the size, intended use and type of room. In some cases noise limits below 30 dB L_{Aeq} may be required, and separate limits for different types of noise may be appropriate; specialist advice should be sought.

4/ Halls are often multi-functional spaces (especially in primary schools) used for activities such as dining, PE, drama, music, assembly, and performing plays and concerts. In such multi-functional spaces the designer should design to the lowest indoor ambient noise level for which the space is likely to be used. For large halls used for formal drama and music performance lower noise levels than those in Table 1.1 are preferable, and levels of 25 dB $L_{Aeq,30min}$ may be appropriate. In these cases specialist advice should be sought.

Speech transmission index

Open-plan spaces require extra specification in order to provide clear communication of speech between teacher and student, and between students, as they are complex acoustic spaces. Therefore, a minimum Speech Transmission Index (STI) is specified in BB93 where it is recommended that a computer model is used to predict the STI.
For open-plan teaching and study spaces the STI must be > 0.6.
As a result noise break-in from the exterior must be assessed to ensure the background noise levels are sufficiently mitigated to ensure the limits can be achieved.

Demonstrating compliance

Acoustic testing is recommended in BB93 to demonstrate compliance with the performance requirements. BB93 recommends that the requirement for testing is included, by the client, in the building contract.

2.3 BS4142: Plant Noise Limits

As per the limits stipulated in section 2.1 Table E noise levels emanating from any proposed items of plant should be designed to be 5dBA below the lowest measured background noise level during the hours of operation at the nearest noise sensitive residential properties.

An assessment in accordance with the methodology of BS4142 should be carried out in the later design stages once all items of plant and their locations have been designed.

3.0 NOISE SURVEY DETAILS

3.1 Noise Survey Positions

Extended unmanned noise surveys have been undertaken at the railway boundary and at the southern façade of the existing commercial units to the south of the site.

Locations are shown on the aerial view in Appendix A.

Position A – Northern Railway Boundary to the rear of commercial Unit 12.

Airborne Noise: The equipment was set up to measure sound levels at 15 minute intervals between 16:00, Tuesday 14th October 2014 and 13.15, Friday 17th October 2014.

Position B – Southern Site Boundary to the south of commercial Unit 22

Airborne Noise: The equipment was set up to measure sound levels at 15 minute intervals between 16:00, Tuesday 14th October 2014 and 13.15, Friday 17th October 2014.

Details of the measurement equipment and procedure used are shown in Appendix.

3.2 Noise indices

The equipment was set to record octave band sound pressure levels at 15minute intervals. The following noise indices used in this assessment are as follows:

$L_{Aeq,T}$: The A-weighted equivalent continuous sound pressure level over a period of time, T.

$L_{Amax,T}$: The A-weighted maximum sound pressure level that occurred during a given period. Measured using the fast (L_{AFmax}) or slow (L_{ASmax}) time weightings.

$L_{A90,T}$: The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background noise level.

$L_{A1,T}$: The A-weighted sound pressure level exceeded for 1% of the measurement period. Indicative of the maximum noise level.

The L_{A90} is considered most representative of the background noise level for the purposes of complying with any Local Authority requirements.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

3.3 Site Survey Weather Conditions

During the unattended noise measurements between Tuesday 14th October 2014 and Friday 17th October 2014, weather reports for the area indicated that temperatures varied between 12 °C and 20 °C during the measurement period, and the wind speed was less than 5 m/s.

These weather conditions are considered suitable for representative measurements.

4.0 NOISE SURVEY RESULTS

4.1. Airborne Noise Survey Results

Extended unmanned noise surveys have been undertaken at the railway boundary and at the southern façade of the existing commercial units to the south of the site.
The results of the airborne noise surveys in Positions A and B as are shown in Table G.

Table G: Summary of results

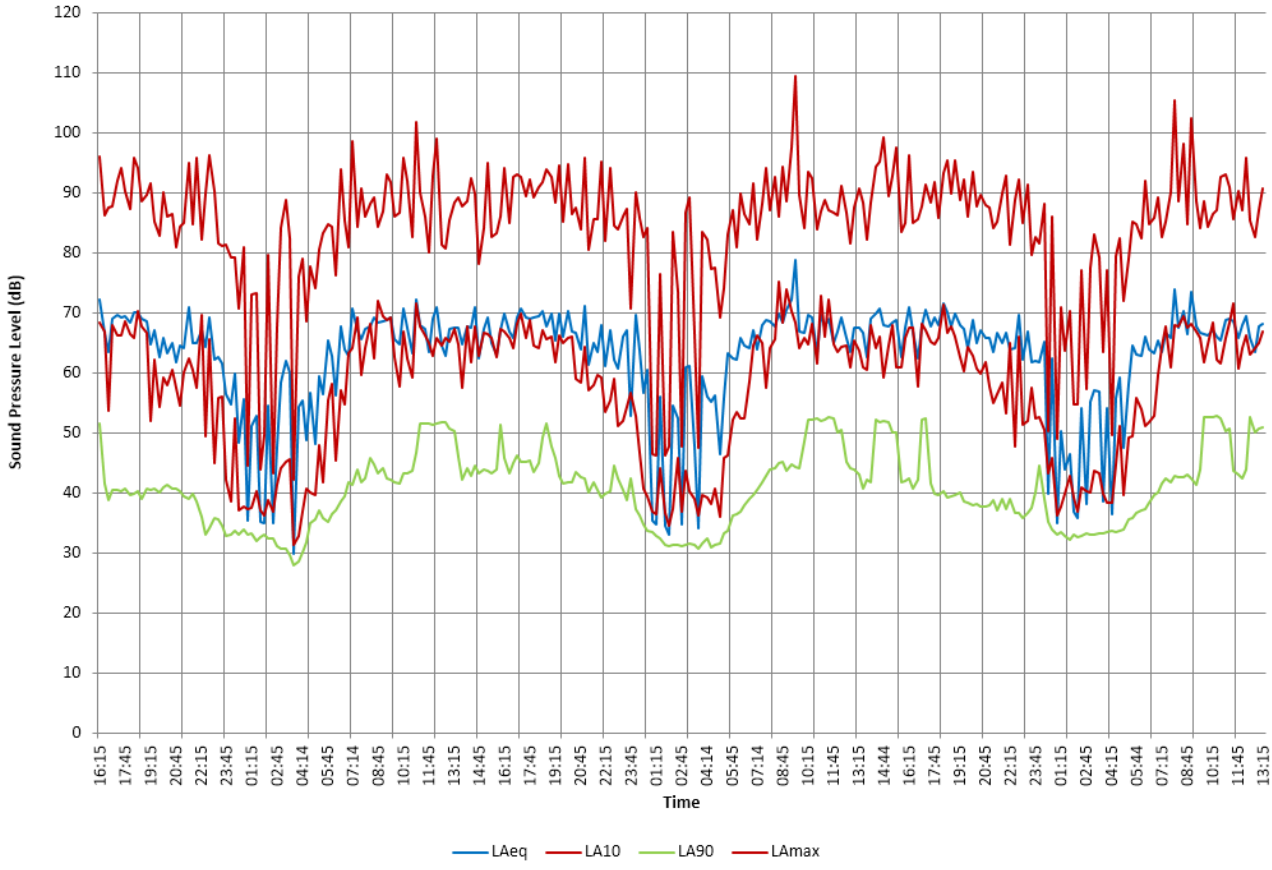
Time period	Maximum $L_{Aeq,30mins}$dB (0700-1800hrs)	$L_{A90,\ 15mins}$dB (Minimum)	Maximum $L_{A1,\ 30mins}$dB (0700-1800hrs)
Position A (Railway)	80*	31*	104*
Position B (Commercial Unit)	n/a	34.2	n/a

*Position A deemed to be a free field location. 3dB has been added to the results of the noise survey to account for façade reflection.

The above survey results have been used to develop a noise map of the site which will help predict the noise levels and sound reduction at all façades of the school.

It is noted that whilst the $L_{Aeq,30mins}$dB maximum levels measured were 80dB this only occurred once in a three day measurement period. Typical maxima noise levels are approximately 10dB lower than this level. See survey position A time history in Figure 1.

Figure 1: Position A survey results (without free field adjustement)



5.0 ASSESSMENT OF NOISE SURVEY RESULTS

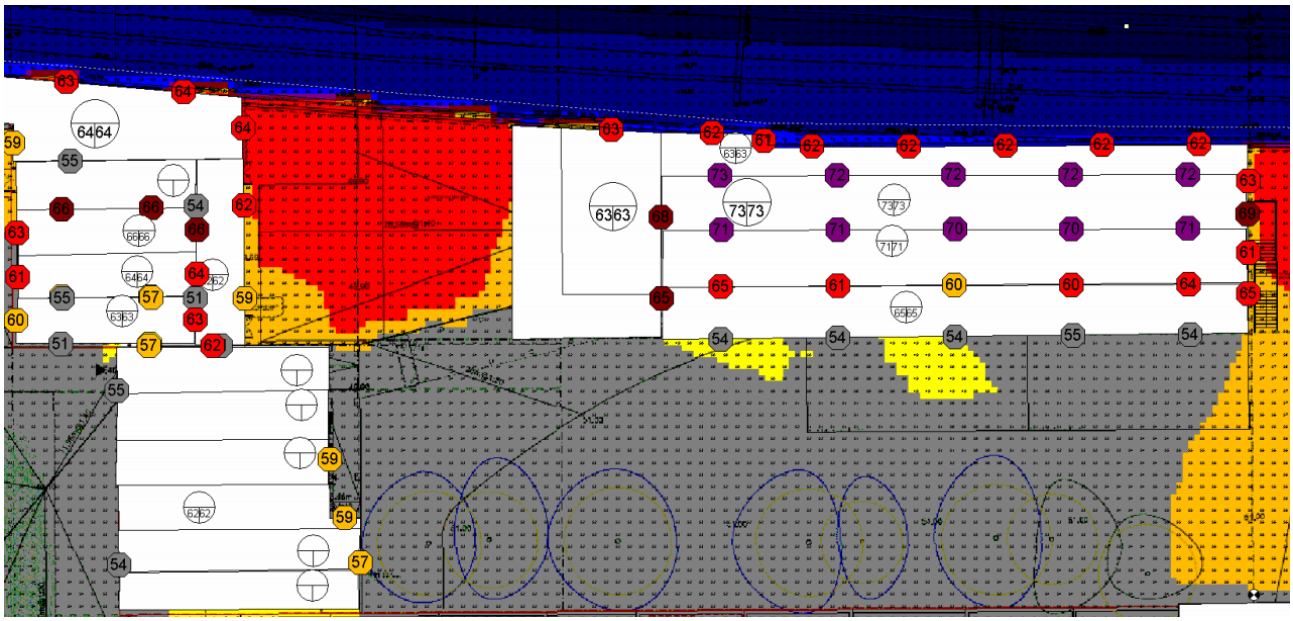
It has been recommended that in order to protect lower level windows and outdoor amenity areas of the school a noise barrier is erected to 1st floor level between the proposed site and railway to the North. The CadnaA predictions take into account the construction of the barrier.

5.1 External Noise Break In

A CadnaA noise map of the site has been constructed to determine the levels of airborne noise mitigation required for each applicable building facade. Plan and 3D views from the model can be found in the Appendix.

The glazing/facade requirements in Table H have been calculated using measured survey data and CadnaA noise mapping calculations to ensure the internal noise targets are achieved. Typically façade insulation values are dictated by $L_{Aeq,15min}$ external noise measurements.

Figure 2: CadnaA Façade Noise Mapping Predictions based on $L_{Aeq,30min}$ survey results.



The minimum single figure R_w performances required from the glazing are given in table H below.

Table H: Façade/glazing requirements to satisfy BB93 Internal Noise Limits

Location	Predicted external noise level, LAeq, dB (30min)	Target internal noise level LAeq, dB (30min)	Minimum Level Difference, D. dB	Recommended minimum glazing sound reduction, Rw dB
GF Railway Façade (Area A on plans)	70	35	35	45
1st Floor Railway Façade (Façade B on plans)	73	35	38	48
Rear Classrooms GF (Façade C on Plans)	53	35	18	28
Rear Classrooms 1st Floor (Façade D on Plans)	56	35	21	31
Western Façade GF (Façade E on Plans)	66	35	31	41
Western Façade 1st Floor (Façade F on Plans)	72	35	37	47
Eastern Façade 1st Floor (Façade G on Plans)	71	35	36	46
Hall Block Eastern Façade GF (Façade H on Plans)	68	35	33	43
Hall Block Western Façade GF (Façade I on Plans)	66	35	31	41
Hall Block Western Façade 1st Floor (Façade J on Plans)	65	35	30	40
Classroom High Level Glazing (Façade K on Plans)	66	35	31	41
Kitchen Skylights (Area L on Plans)	60	45	15	25
Hall Skylights (Area M on Plans)	67	35	32	42
Southern Unit Skylights (Façade N on Plans)	60	35	25	35
Southern Unit East Facade (Façade O on Plans)	56	35	21	31

Note: R_w is the "overall weighted sound reduction index" tested in a laboratory.

Based on the above calculations achieving the BB93 internal noise criteria as defined in section 2. These levels may not be met during atypical traffic flows or weather conditions and individual loud events (sirens, horns, trains, etc) will exceed these levels.

Ventilation noise will increase the overall ambient levels in the rooms should be appropriately designed so that the cumulative levels do not exceed the design ranges in Table F.

Other façade elements should designed to be a minimum of Rw 5dB higher than the above glazing ratings.

The calculations above assume that all glazing will be well sealed and there are no other acoustic weaknesses in the façades e.g. façade vents and that reverberation times in rooms are not greater than 1 second.

Glazing suppliers should submit manufacturers test data sheet for the glazing (including frames) for approval before order to ensure they meet the correct criteria above.

Typical Glazing build ups required to satisfy the above requirements can be found in Appendix.

Ventilation

Where buildings have natural air ventilation via the external facade acoustically attenuated air paths should to be constructed so as not to degrade the acoustic performance of the building fabric.

Acoustic $D_{ne,w}$ ratings of trickle vents should match the specified sound reduction index R_w of the windows to ensure the performance is maintained.

Openable passive acoustically attenuated ventilation can generally be designed to provide level differences (D) circa 20 dB to 25 dB. Based on the predicted external noise levels all internal spaces with the exception of the southern facades require greater levels of sound insulation than can be achieve with openable passive ventilation.

Other areas are to be ventilated using mechanical ventilation and/or natural air exhaust chimney with acoustic attenuators providing sufficient noise reductions to ensure that sound insulation of the building envelope is maintained.

5.2 External amenity noise

The CadnaA model in Figure 2 shows the proposed main playground area of the school.

The model has been predicted using the maximum $L_{Aeq,30min}$ measured over a 3 day period during the week.

As detailed in Section 2 noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB$L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min.}$ Some areas of the playground exceed the recommended levels by 2-3dB but an area has been provided that has noise levels lower than 50 dB $L_{Aeq,30min.}$

Due to high noise levels on the site it has been recommended that a noise barrier is constructed to 1st floor level along the northern boundary to the railway to reduce noise levels from the railway in the external amenity areas of the school. The noise mapping predictions include the effects of the proposed barrier.

It is noted that whilst some areas of the playground exceed the maximum levels recommended in BB93 the survey results as shown in Figure 1 indicate that this would only occur approximately once a day with noise levels at other times being approximately 10dBA lower than those shown in Figure 2 below.

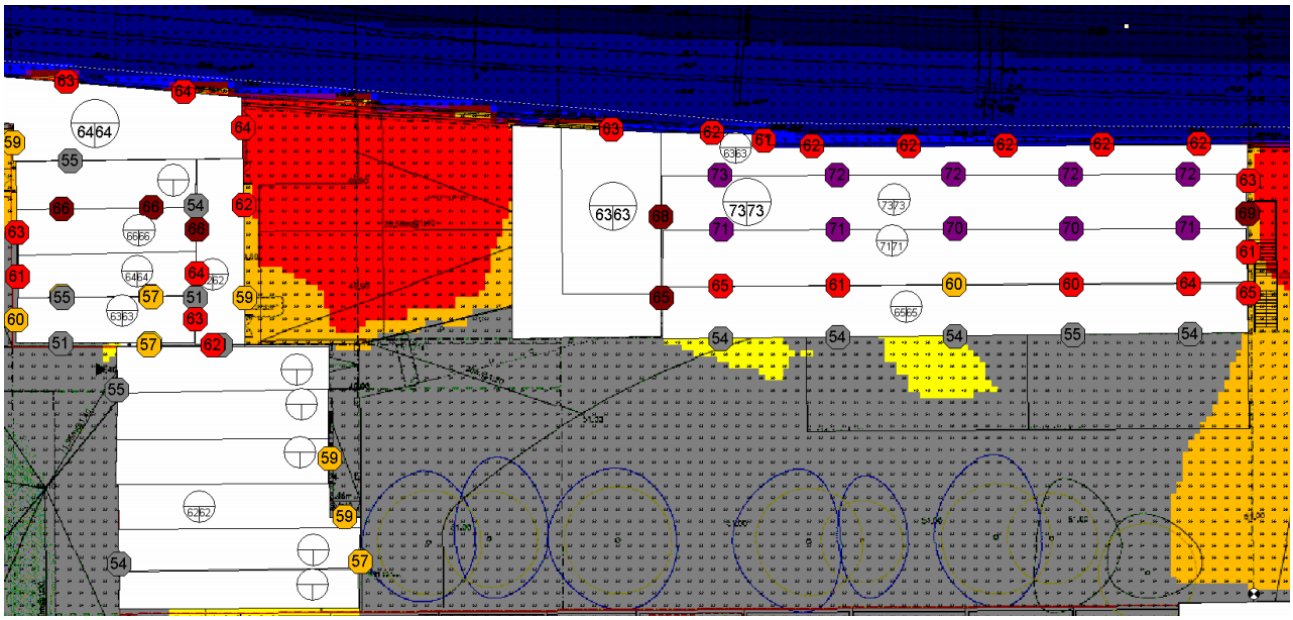
The zone in Yellow shows the area of the playground where noise levels are below 50 dB $L_{Aeq,30min.}$

The zone in Grey shows the area of the playground where noise levels are between 50 and 55 dB $L_{Aeq,30min.}$

The zone in Orange shows the area of the playground where noise levels are between 55 and 60 dB $L_{Aeq,30min.}$

The zone in Red shows the area of the playground where noise levels are between 60 and 63 dB $L_{Aeq,30min.}$

Figure 2: CadnaA Playground Noise Mapping Predictions based on $L_{Aeq,30min}$ survey results.



5.3 Plant Noise Limits

Table I: Comparison of airborne noise results in Position A and B with Table D

Noise description and location of measurement	Period	Time	Required Noise level	Limit in Position A	Limit in Position B
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90	31dB(A) – 5dB(A) =**26dB(A)**	34 dB(A) – 5dB(A) =**29dB(A)**
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90	31 dB(A) – 10dB(A) =**21dB(A)**	34 dB(A) – 10dB(A) =**24dB(A)**
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90	31dB(A) – 10dB(A) =**21dB(A)**	34 dB(A) – 10dB(A) =**24dB(A)**
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dB$_{LAeq}$	n/a	n/a

The above results are taken from measurements conducted over a 24Hr period. If items of plant can be set to switch off between 23:00 and 07:00 (night time) higher limits will be possible.

Since specific AC units and exact locations have not been selected yet, this assessment sets maximum noise limits allowed at the external facades of surrounding dwellings.

6.0 VIBRATION AND STRUCTURE BORNE NOISE

The proposed site lies adjacent to a railway line to the North and as a result the proposed development lies within 30m of a railways line and may be subject to perceptible vibration and reradiated noise.

As per the neighbouring sites on Iverson Road GSAD recommend that if planning permission is granted a vibration assessment should be undertaken on the site.

The results of the surveys should be compared with BS6472:1992, BB93 internal noise limits and LB Camden criteria to determine whether perceptible vibration levels, vibration dose levels (VDV) and levels of re radiated noise are acceptable in all areas of the proposed development.

Vibration surveys should be undertaken at a minimum of two locations that represent the closest positions of any residential block to the railway line.

Assessments should take into account the structural changes in the proposed buildings to determine how the proposed construction of the new development is likely to impact on the measured pre-construction vibration levels.

Where vibration noise levels exceed the required criteria as full scheme of vibration mitigation measures should be submitted to Camden Council for approval prior to the commencement of works. The mitigation measures should ensure that the frequency distribution of the vibration energy is fully understood to ensure that the appropriate mitigation is implemented.

7.0 CONSTRUCTION NOISE AND VIBRATION

Construction noise should be controlled and managed according to the principles of British Standard BS 5228-1:2009. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration.

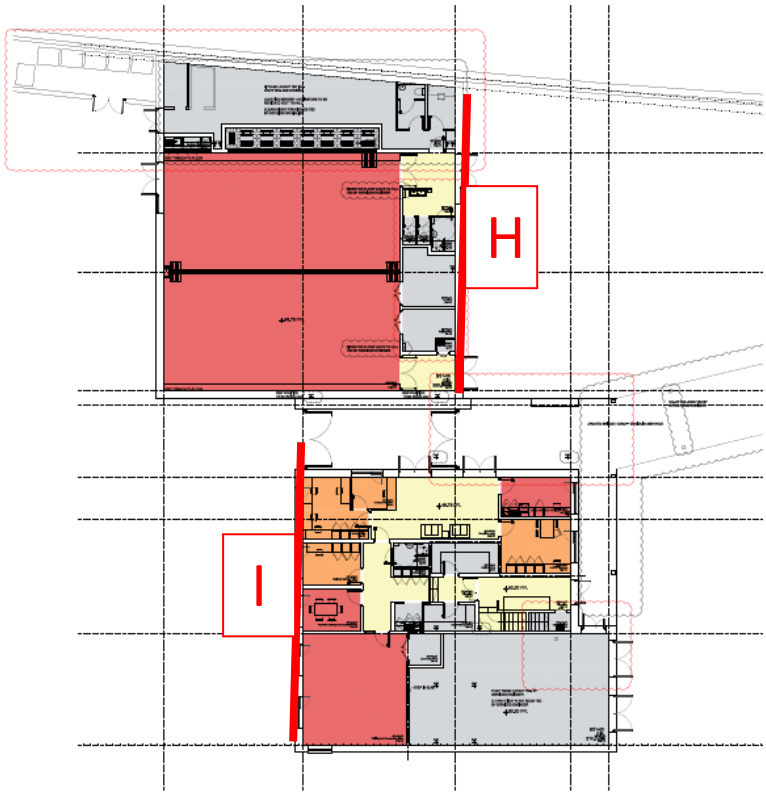
The main Contractor will be required to submit a method statement showing how noise and vibration will be controlled throughout the contract to meet limits at residences agreed with the Camden Council.

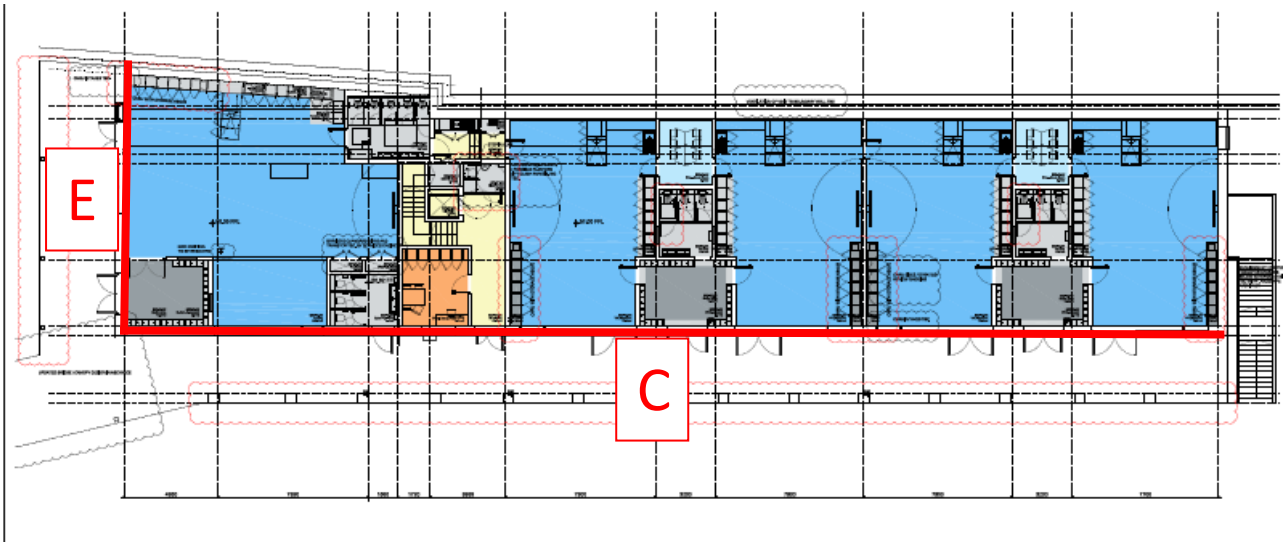
Construction methods will be chosen to minimise noise in residential buildings. Protocols will be arranged for warning the Contractor in the short term.

APPENDIX

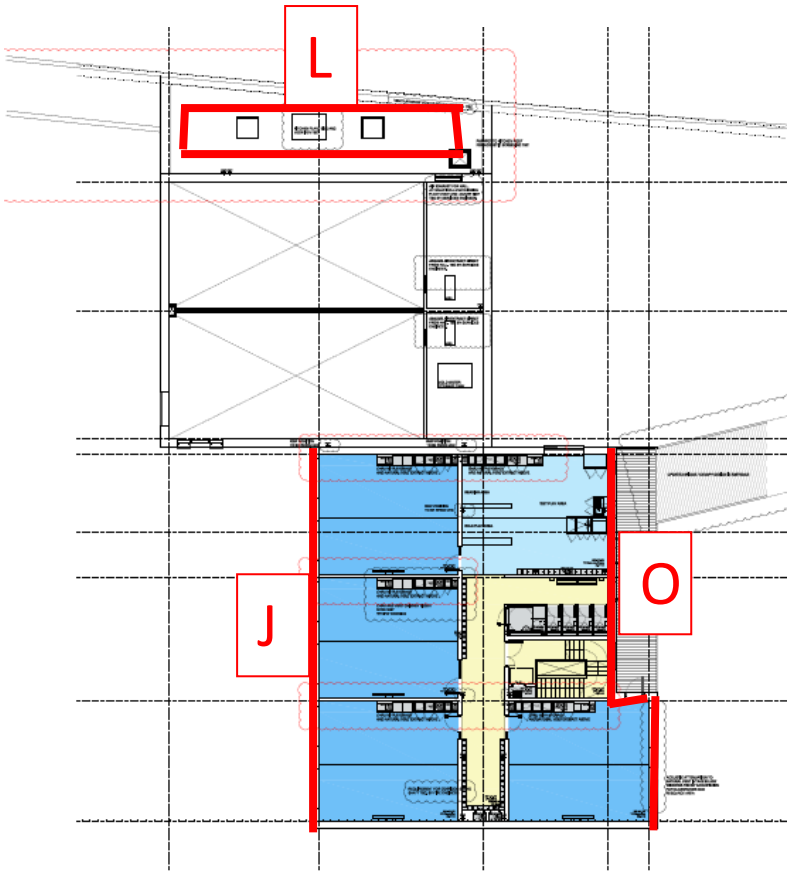
APPENDIX A: PROPOSED PLANS AND GLAZING LOCATIONS

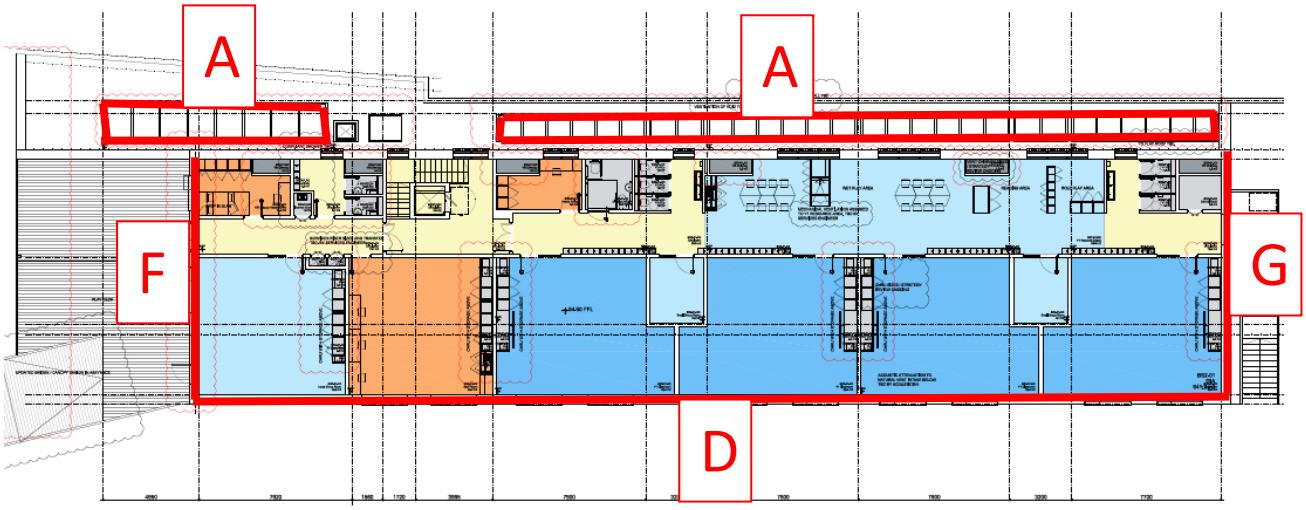
GROUND FLOOR PLAN



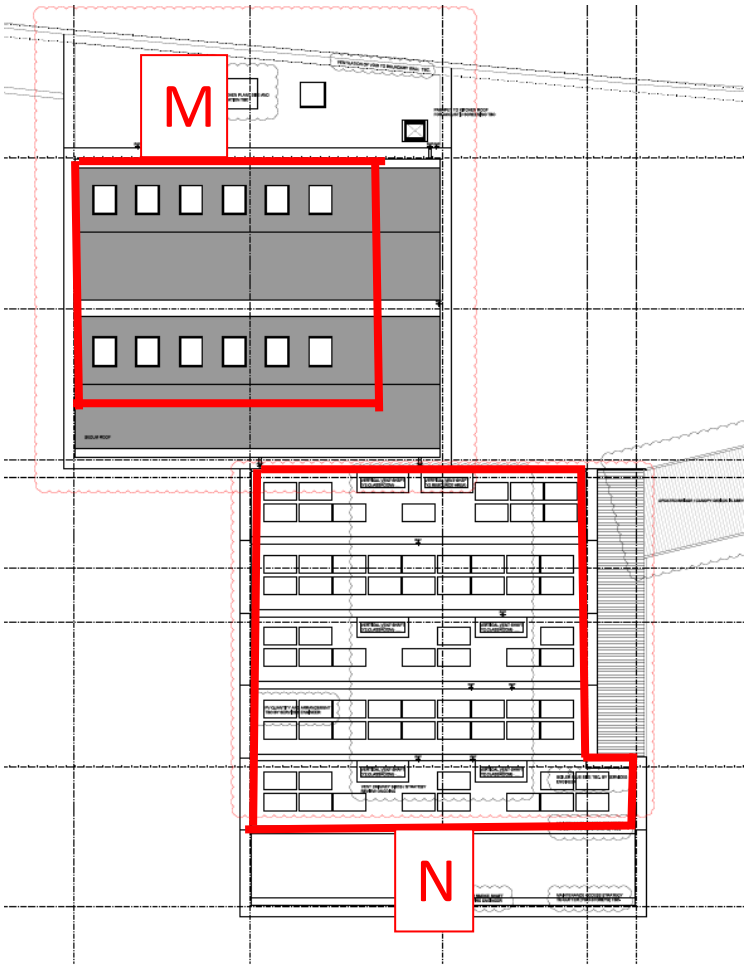


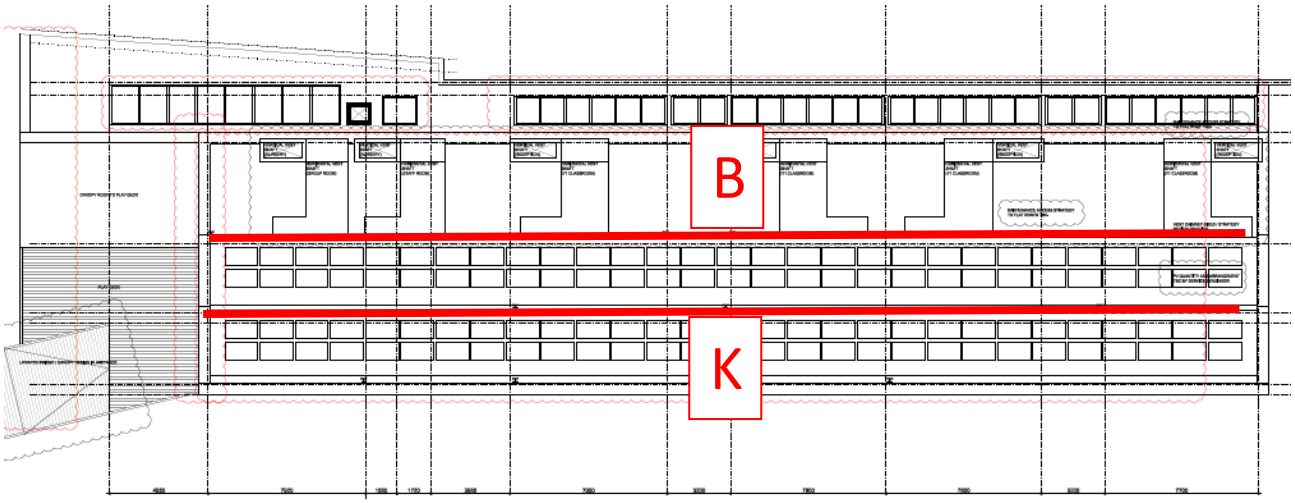
FIRST FLOOR PLAN





ROOF PLAN





APPENDIX B: NOISE SURVEY POSITIONS

Existing site

Position A - Rear of Commercial Unit 12 adjacent to railway boundary

Position B Rear of Commercial Unit 22

APPENDIX C: MEASUREMENT EQUIPMENT AND PROCEDURE

Airborne Noise

Background noise levels have been measured over a minimum period of 24 hours at the front and rear of the proposed site, the measurement positions are shown in Appendix A.

The levels were recorded as A-weighted and octave band L_{eq}, L_{max} and L_{90} using the following equipment.

2 x Norsonic 118 Real Time Analyser
Norsonic 1251 Calibrator
GRAS Environmental Microphone

The equipment was calibrated before and after the survey and no drift from calibration was found.

The weather conditions throughout the survey were acceptable throughout.

APPENDIX D: ACOUSTIC RATINGS OF TYPICAL GLAZING

The glazed areas set out in this report should achieve the stated airborne sound insulation standards.
Laboratory data for each glazing type should be submitted by the Supplier, measured according to BS EN 140 – 3:1995, from a UKAS certified laboratory.
Glazing elements should be set in neoprene gaskets with no contact with frames.
All glazing/frames should be sealed airtight to building structure with silicone mastic.
All framing and glazing details to be submitted to the acoustic consultant for approval prior to installation.

TYPICAL ACOUSTIC GLAZING RATINGS

The table below gives the octaves band acoustic performance for all types of glazing required to achieve the recommended acoustic specifications;

Acoustic Rating	125	250	500	1k	2k	4k	Typical Build-up
Rw29	21	17	25	35	37	31	**Double** - 4mm/20mm/4mm
Rw32	21	20	26	38	37	39	**Double** - 6mm/20mm/6mm
Rw35	24	24	32	37	37	44	**Double** - 10mm/20mm/6mm
Rw38	23	24	34	42	43	52	**Double** - 6mm/20mm void/6.8mm lam
Rw41	24	26	40	48	46	54	**Double** - 6mm/20mm void/8.8mm lam
Rw42	23	28	41	47	45	55	**Double** - 6mm/20mm void/10.8mm lam
Rw45	28	34	44	52	47	55	**Double** - 6.8mm lam/20mm void/10.8mm lam
Rw47	26	36	46	50	52	63	**Double** - 8.8mm lam/20mm void/12.8mm lam or **Triple Glazing** Rw32 Outer Pane (6mm/20mm/6mm double) 150mm void between panes Rw 37dB Inner Pane (8.2mm lam single)
Rw49	36	43	48	52	54	58	**Triple Glazing** Rw32 Outer Pane (6mm/20mm/6mm double) 150mm void between panes Rw 37dB Inner Pane (8.2mm laminated glass)

Notes:
1/ All double glazed values shown in the table above with the exception of Rw45dB glazing are by Pilkington Optiphon.
2/ Triple Glazing has been predicted using INSUL.
3/ Lam = Laminated glass.
4/ Laminated double glazing is generally Argon filled.
5/ Alternative equivalent manufacturers can be used providing manufacturer's test data for selected windows and framing systems are approved by the acoustic consultant to ensure compliance with the performance specification prior to installation.

APPENDIX E: SURVEY RESULTS

Position A: Railway

Date	Time	L_{Aeq}	L_{Amax}	L_{Aeq}							
				63	125	250	500	1k	2k	4k	8k
14/10/2014	16:15:00	72.1	96.0	57.0	55.1	57.2	60.0	61.1	65.0	65.4	68.1
14/10/2014	16:30:00	66.7	86.3	54.1	54.0	54.6	55.8	57.8	58.7	58.5	58.8
14/10/2014	16:45:00	63.5	87.5	50.8	50.3	51.9	53.0	55.6	61.2	60.7	62.6
14/10/2014	17:00:00	68.9	87.7	56.7	56.1	54.7	60.3	67.9	61.5	62.8	59.5
14/10/2014	17:15:00	69.7	91.9	56.7	54.0	57.8	57.8	60.2	63.3	62.7	65.6
14/10/2014	17:30:00	69.3	94.2	54.1	54.7	55.1	57.0	59.7	67.3	66.1	59.6
14/10/2014	17:45:00	69.5	90.3	53.9	54.2	55.4	57.0	59.5	65.4	63.6	67.4
14/10/2014	18:00:00	68.3	87.2	55.2	56.1	57.0	57.1	58.7	61.8	59.4	57.9
14/10/2014	18:14:00	70.1	95.7	54.0	53.7	53.7	55.8	59.4	63.4	59.6	61.5
14/10/2014	18:30:00	70.0	94.0	53.8	52.8	55.1	56.1	58.7	61.7	62.3	66.8
14/10/2014	18:45:00	68.9	88.6	57.6	60.4	59.2	62.4	63.8	64.6	67.0	68.6
14/10/2014	19:00:00	68.5	89.6	53.8	54.5	53.8	55.0	57.0	59.9	64.1	65.2
14/10/2014	19:15:00	64.7	91.5	49.8	50.8	50.7	50.2	53.0	57.2	56.0	57.3
14/10/2014	19:30:00	67.1	85.2	51.7	54.5	52.8	52.1	54.9	57.9	68.5	57.2
14/10/2014	19:45:00	62.7	82.8	48.9	49.2	51.0	49.2	51.7	54.1	54.1	55.0
14/10/2014	20:00:00	65.7	90.1	51.1	50.6	49.8	49.9	53.1	55.2	54.1	54.8
14/10/2014	20:15:00	63.3	86.0	50.1	50.0	50.0	49.9	52.9	55.0	54.6	54.5
14/10/2014	20:30:00	64.9	86.5	50.6	50.7	51.5	50.9	54.5	59.3	60.1	61.7
14/10/2014	20:45:00	61.8	80.8	51.1	52.8	52.1	56.4	56.5	63.6	62.5	62.2
14/10/2014	21:00:00	64.5	84.4	51.2	53.1	51.1	53.9	59.0	68.5	63.8	60.0
14/10/2014	21:15:00	64.0	85.0	52.5	51.8	53.2	51.9	55.0	61.6	60.1	61.7
14/10/2014	21:30:00	70.8	95.0	58.5	56.6	55.5	60.2	60.1	65.2	64.3	66.0
14/10/2014	21:45:00	65.0	84.7	53.5	55.0	63.1	53.3	57.4	61.1	59.8	62.6
14/10/2014	22:00:00	64.9	95.8	52.7	52.5	62.0	55.0	68.0	63.0	63.7	56.3
14/10/2014	22:15:00	67.0	82.1	54.4	57.9	58.4	61.3	63.8	67.4	64.5	67.3
14/10/2014	22:30:00	64.4	89.9	51.6	49.5	54.7	51.7	53.2	56.1	55.3	63.2
14/10/2014	22:45:00	69.3	96.3	55.0	57.0	54.7	61.1	60.0	64.8	64.1	65.3
14/10/2014	23:00:00	62.1	90.2	46.0	47.5	46.3	46.1	46.8	49.1	50.6	48.4
14/10/2014	23:14:00	62.6	81.5	49.7	49.6	52.0	50.4	52.8	55.2	54.3	53.0
14/10/2014	23:30:00	61.6	81.2	51.4	49.8	51.0	53.2	56.8	62.1	60.3	62.8
14/10/2014	23:45:00	56.4	81.3	47.2	46.0	44.6	44.7	45.2	47.2	47.9	47.0
15/10/2014	00:00:00	54.8	79.3	45.9	46.0	46.5	43.8	48.9	46.9	45.6	44.6
15/10/2014	00:15:00	59.9	79.3	51.7	48.5	52.4	52.2	56.4	59.8	59.7	64.1
15/10/2014	00:30:00	48.3	70.6	45.0	45.4	43.5	40.9	41.3	42.3	41.5	41.8
15/10/2014	00:45:00	55.6	80.9	45.6	43.2	42.7	40.8	42.6	45.9	44.7	41.5
15/10/2014	01:00:00	35.4	44.6	39.2	40.8	41.3	38.0	38.0	39.3	38.5	32.7
15/10/2014	01:15:00	51.1	73.0	44.0	43.9	42.9	40.3	42.5	46.2	46.9	46.8
15/10/2014	01:30:00	52.8	73.3	42.9	42.7	43.7	42.1	42.6	45.8	45.1	45.0

15/10/2014	01:45:00	35.2	43.9	41.8	42.2	42.0	38.2	38.3	38.6	36.6	32.0
15/10/2014	02:00:00	34.9	49.6	38.6	41.4	42.7	39.1	37.3	38.6	39.6	36.3
15/10/2014	02:15:00	54.6	79.7	42.1	42.1	42.6	41.2	43.2	48.3	49.1	44.5
15/10/2014	02:30:00	34.9	43.2	40.4	42.2	42.7	39.1	38.6	42.4	44.0	38.9
15/10/2014	02:45:00	47.7	67.8	42.8	44.5	43.3	42.6	41.5	44.5	47.5	44.0
15/10/2014	03:00:00	58.3	84.0	43.3	44.7	45.4	51.9	52.0	52.9	56.2	64.6
15/10/2014	03:15:00	62.0	88.8	52.4	49.7	49.4	51.1	55.3	59.1	58.1	64.7
15/10/2014	03:30:00	60.0	82.4	44.2	43.4	45.0	43.6	44.0	46.3	47.3	47.5
15/10/2014	03:45:00	29.8	42.1	38.8	40.3	40.8	41.8	38.6	38.6	42.1	37.5
15/10/2014	04:00:00	54.3	76.1	42.6	43.7	43.1	42.1	43.8	43.7	46.5	46.1
15/10/2014	04:14:00	55.4	78.9	42.0	43.2	44.2	41.9	43.0	45.7	45.9	43.8
15/10/2014	04:30:00	48.8	68.5	41.6	42.4	43.1	41.6	43.1	43.2	49.7	47.6
15/10/2014	04:44:00	56.6	77.8	45.4	46.3	45.7	46.6	46.6	47.2	52.4	50.1
15/10/2014	05:00:00	48.1	74.1	48.4	46.5	45.6	43.2	40.7	43.3	51.1	44.8
15/10/2014	05:15:00	59.5	80.4	52.3	53.2	55.7	52.6	51.5	58.2	55.8	51.2
15/10/2014	05:30:00	56.5	83.2	49.7	50.6	49.8	52.4	57.4	58.3	59.6	59.8
15/10/2014	05:45:00	65.3	84.8	53.6	52.5	52.8	52.8	57.4	60.0	66.1	68.5
15/10/2014	05:59:00	62.9	84.4	50.9	50.1	52.0	51.8	55.1	61.8	62.1	64.3
15/10/2014	06:15:00	56.3	76.2	47.0	48.1	45.8	45.4	46.1	47.4	52.3	50.5
15/10/2014	06:30:00	67.7	93.8	52.7	52.1	51.5	52.1	54.7	55.5	54.6	54.0
15/10/2014	06:45:00	63.9	85.4	50.8	51.5	51.7	48.9	53.8	54.0	53.3	53.9
15/10/2014	07:00:00	62.8	81.0	52.3	52.7	54.0	55.4	57.7	63.1	61.8	64.8
15/10/2014	07:14:00	70.6	98.6	53.8	53.1	53.7	58.8	56.7	58.9	58.0	60.0
15/10/2014	07:30:00	67.1	84.4	55.0	57.2	56.7	59.0	59.3	65.2	63.4	65.7
15/10/2014	07:45:00	65.5	90.7	52.5	53.3	52.7	52.9	54.2	55.6	60.6	56.1
15/10/2014	08:00:00	67.3	86.1	53.2	54.9	54.1	57.9	58.2	59.4	66.5	57.8
15/10/2014	08:15:00	67.8	88.1	56.2	55.6	57.8	56.9	59.1	63.6	62.0	66.8
15/10/2014	08:30:00	69.1	89.3	54.9	54.7	54.4	53.6	57.7	60.8	57.9	57.3
15/10/2014	08:45:00	68.4	84.3	55.0	60.2	57.6	58.0	60.2	65.1	69.5	60.2
15/10/2014	09:00:00	68.6	86.8	54.6	55.8	55.5	56.7	61.2	68.7	65.0	64.9
15/10/2014	09:15:00	68.8	93.0	54.6	55.0	55.9	58.2	62.1	68.8	66.5	65.6
15/10/2014	09:29:00	69.1	91.8	54.5	55.5	54.8	56.2	59.8	62.0	60.8	62.1
15/10/2014	09:45:00	65.5	86.0	54.2	53.3	54.8	55.9	59.2	64.4	61.9	64.1
15/10/2014	10:00:00	64.8	86.6	53.0	52.6	53.1	54.1	57.4	57.1	55.3	56.0
15/10/2014	10:15:00	70.6	95.7	56.7	56.9	55.7	59.3	59.7	65.5	62.6	63.9
15/10/2014	10:30:00	67.6	92.0	56.2	55.6	54.6	55.0	57.5	57.2	56.3	57.3
15/10/2014	10:45:00	63.2	82.7	55.9	54.7	54.5	53.7	55.3	57.9	57.3	59.1
15/10/2014	11:00:00	72.2	101.7	61.3	60.2	61.0	61.1	65.3	65.8	64.7	66.7
15/10/2014	11:15:00	68.0	90.1	57.7	57.9	59.0	58.8	61.6	68.4	68.1	64.7
15/10/2014	11:30:00	67.3	86.0	55.4	55.1	59.4	57.7	57.5	58.6	58.0	58.4
15/10/2014	11:45:00	63.5	80.0	57.0	55.7	56.2	58.9	60.2	62.1	57.6	63.7
15/10/2014	12:00:00	69.0	92.8	56.0	58.4	57.4	59.9	60.1	63.1	61.9	57.3
15/10/2014	12:15:00	71.0	98.9	56.6	55.9	56.8	60.4	63.6	64.2	61.1	63.7
15/10/2014	12:29:00	64.5	81.3	54.6	55.0	55.3	58.0	60.1	59.7	59.3	61.0

15/10/2014	12:45:00	62.8	80.6	56.3	55.6	56.2	58.8	62.0	62.7	62.2	64.3
15/10/2014	13:00:00	67.2	85.4	55.8	56.9	57.7	62.4	62.9	68.1	61.2	57.9
15/10/2014	13:15:00	67.6	88.3	56.3	55.0	56.2	60.1	60.1	65.7	63.1	65.8
15/10/2014	13:30:00	67.4	89.1	57.3	57.6	57.1	58.4	59.3	60.5	59.5	61.6
15/10/2014	13:45:00	64.8	87.7	54.3	53.6	53.4	53.4	57.1	60.5	60.2	62.4
15/10/2014	14:00:00	67.7	88.5	56.6	56.7	56.7	59.1	60.0	63.8	62.8	64.8
15/10/2014	14:15:00	67.6	92.4	55.7	55.1	54.6	56.2	58.3	63.4	64.0	66.0
15/10/2014	14:29:00	70.9	89.8	58.3	58.9	59.8	64.7	66.1	64.8	61.9	63.2
15/10/2014	14:45:00	62.3	78.2	54.0	54.5	53.8	53.6	56.5	59.6	61.7	64.2
15/10/2014	15:00:00	67.2	84.1	58.6	58.6	57.7	60.7	64.0	66.5	63.5	60.6
15/10/2014	15:15:00	69.2	95.0	57.3	56.4	56.5	56.5	59.9	63.1	63.8	65.5
15/10/2014	15:29:00	65.0	82.6	56.7	56.4	55.2	54.6	57.7	59.1	59.7	61.0
15/10/2014	15:45:00	63.0	83.3	56.7	56.0	55.7	56.8	57.7	62.2	62.9	65.1
15/10/2014	16:00:00	67.0	86.0	57.0	57.4	57.6	61.8	59.4	61.7	59.0	58.7
15/10/2014	16:15:00	69.8	94.2	56.2	55.8	56.0	58.2	58.8	60.4	62.4	65.9
15/10/2014	16:30:00	66.8	84.9	55.5	54.8	54.0	53.8	60.7	58.6	58.4	58.7
15/10/2014	16:45:00	65.8	92.7	56.0	55.6	55.7	55.3	56.4	62.2	61.2	62.9
15/10/2014	17:00:00	69.3	93.0	56.1	59.5	57.8	58.7	59.8	63.6	59.1	58.0
15/10/2014	17:15:00	70.6	92.7	57.8	57.5	59.4	58.9	61.2	62.7	64.9	66.2
15/10/2014	17:30:00	69.3	89.4	56.7	55.5	56.8	57.9	60.9	62.1	59.0	61.1
15/10/2014	17:45:00	69.0	92.2	54.8	58.2	58.5	58.8	59.2	62.5	66.6	66.2
15/10/2014	18:00:00	69.2	89.1	57.2	56.3	56.6	61.1	60.2	65.3	63.2	58.5
15/10/2014	18:15:00	69.4	90.8	56.6	56.1	57.0	57.9	63.0	62.1	60.2	64.3
15/10/2014	18:30:00	70.2	91.7	57.1	55.8	58.3	56.6	59.8	61.6	64.5	67.5
15/10/2014	18:44:00	67.7	93.8	52.9	52.7	52.4	53.2	56.0	57.7	55.9	58.0
15/10/2014	19:00:00	69.8	92.5	56.5	54.6	54.6	59.4	58.7	63.1	62.7	63.9
15/10/2014	19:15:00	65.4	88.4	55.9	54.9	54.5	54.5	56.5	58.0	57.5	59.9
15/10/2014	19:30:00	69.8	94.6	54.8	53.2	53.3	54.3	58.3	62.9	58.7	64.0
15/10/2014	19:45:00	66.0	85.1	54.0	52.8	53.0	53.0	56.0	60.3	59.4	61.9
15/10/2014	20:00:00	70.2	94.8	56.5	57.0	55.9	57.8	59.1	62.3	59.7	64.3
15/10/2014	20:15:00	66.9	86.5	54.4	53.4	53.5	52.6	56.9	59.2	59.1	61.1
15/10/2014	20:30:00	66.6	87.4	53.8	52.4	51.7	51.8	56.3	57.6	57.2	57.0
15/10/2014	20:45:00	63.9	83.8	52.8	52.3	52.7	51.3	54.8	62.9	60.5	65.0
15/10/2014	21:00:00	71.2	95.8	55.8	55.9	57.2	56.3	58.2	61.2	58.9	57.5
15/10/2014	21:15:00	61.3	80.5	53.9	52.6	53.3	52.1	55.5	59.8	58.6	62.6
15/10/2014	21:29:00	64.9	85.5	54.0	52.9	51.9	52.2	56.7	56.8	54.9	55.9
15/10/2014	21:45:00	63.4	85.5	55.9	57.9	58.0	53.8	55.7	62.9	60.2	62.4
15/10/2014	22:00:00	67.9	95.1	54.2	52.8	58.3	52.9	57.7	57.8	54.9	62.0
15/10/2014	22:15:00	61.2	82.0	53.5	53.0	54.2	59.9	55.0	60.3	57.2	53.1
15/10/2014	22:30:00	67.0	94.2	57.7	58.2	58.9	57.0	57.5	60.0	61.3	62.0
15/10/2014	22:45:00	62.1	84.6	54.8	54.1	53.8	52.8	56.0	63.4	60.4	63.6
15/10/2014	23:00:00	60.6	83.8	50.1	49.5	49.5	48.6	48.7	50.9	50.0	49.5
15/10/2014	23:15:00	66.0	86.0	54.8	53.2	51.7	49.9	53.6	56.0	54.6	55.8
15/10/2014	23:30:00	67.0	87.3	53.7	54.9	54.9	54.3	57.9	59.1	59.1	61.8

15/10/2014	23:45:00	52.8	70.7	45.3	46.0	44.7	43.5	43.1	46.0	45.2	44.9
16/10/2014	00:00:00	69.6	90.1	56.8	53.4	53.8	55.0	55.5	59.1	56.9	58.0
16/10/2014	00:15:00	63.7	85.7	50.0	48.7	49.3	48.6	51.0	53.1	51.7	52.1
16/10/2014	00:30:00	56.6	82.6	46.5	46.2	45.5	43.0	46.2	48.9	45.1	45.9
16/10/2014	00:45:00	60.4	84.2	47.1	46.6	47.3	43.3	46.0	50.0	48.4	50.0
16/10/2014	01:00:00	35.3	46.5	41.3	42.6	43.4	40.0	40.5	41.3	40.6	37.9
16/10/2014	01:15:00	34.8	46.2	38.9	40.7	40.6	38.2	38.5	41.0	41.7	35.8
16/10/2014	01:30:00	56.1	76.5	47.1	46.9	46.7	44.8	46.5	50.1	49.2	50.6
16/10/2014	01:45:00	34.6	46.2	39.7	42.2	42.3	39.2	39.5	40.5	38.8	36.6
16/10/2014	02:00:00	33.0	47.7	39.1	40.3	40.8	38.8	38.9	40.2	39.3	36.1
16/10/2014	02:15:00	54.6	83.4	42.0	42.4	43.6	40.4	41.3	43.4	42.0	43.3
16/10/2014	02:30:00	52.4	73.5	46.2	46.8	47.1	43.3	45.5	46.5	46.1	45.5
16/10/2014	02:45:00	34.8	47.7	41.4	41.5	42.6	38.6	38.6	40.0	38.5	35.3
16/10/2014	03:00:00	61.0	86.7	46.6	45.6	44.9	43.9	46.6	48.0	46.0	46.2
16/10/2014	03:15:00	61.2	89.2	46.9	45.8	46.4	44.0	44.0	46.8	46.7	46.6
16/10/2014	03:30:00	47.8	66.5	41.5	43.0	42.9	39.9	40.9	41.9	42.4	42.4
16/10/2014	03:45:00	34.0	47.6	40.4	42.5	41.9	38.8	38.9	40.3	38.5	37.7
16/10/2014	04:00:00	59.4	83.4	48.3	46.8	46.6	45.4	46.9	48.5	45.4	45.8
16/10/2014	04:14:00	56.1	82.2	42.8	43.7	43.8	42.2	43.5	44.7	44.9	44.4
16/10/2014	04:30:00	55.2	77.3	46.8	44.9	44.2	43.9	44.1	48.3	47.2	47.1
16/10/2014	04:45:00	56.3	77.5	44.2	46.2	45.0	44.9	45.9	47.9	47.7	48.7
16/10/2014	05:00:00	46.5	69.2	42.0	42.8	43.6	43.9	41.0	43.3	44.3	43.6
16/10/2014	05:15:00	55.9	74.1	46.4	47.8	46.2	45.2	45.9	48.1	49.4	49.5
16/10/2014	05:29:00	63.2	83.0	49.5	50.5	49.7	57.1	62.2	59.3	59.6	54.0
16/10/2014	05:45:00	62.4	87.0	50.0	49.1	48.7	48.3	52.6	52.5	52.3	52.4
16/10/2014	06:00:00	62.1	81.0	50.7	50.3	52.1	51.5	55.8	62.4	64.1	66.1
16/10/2014	06:15:00	65.7	89.8	50.4	50.4	52.0	48.6	50.6	52.6	52.1	52.7
16/10/2014	06:30:00	64.5	86.5	51.3	50.4	50.6	49.5	52.7	54.5	54.5	53.7
16/10/2014	06:45:00	64.0	84.7	51.0	51.1	51.1	50.6	55.3	58.3	57.7	60.1
16/10/2014	07:00:00	67.0	91.5	53.6	53.3	55.2	56.6	59.1	62.6	63.9	65.9
16/10/2014	07:14:00	63.8	82.1	53.3	56.1	55.0	56.8	58.7	61.9	58.0	56.6
16/10/2014	07:30:00	67.9	88.1	54.5	54.3	54.0	55.2	58.9	62.4	61.4	63.5
16/10/2014	07:45:00	68.7	94.2	52.6	53.3	53.2	52.1	54.7	56.2	54.3	55.3
16/10/2014	08:00:00	68.5	87.0	55.1	57.4	57.7	61.5	59.6	62.0	62.5	59.2
16/10/2014	08:15:00	67.7	92.6	55.5	54.2	55.8	56.5	60.1	63.1	61.0	67.5
16/10/2014	08:30:00	69.8	86.1	58.8	59.2	64.0	64.2	64.3	67.5	65.0	66.1
16/10/2014	08:45:00	68.4	94.3	56.8	57.5	62.3	60.8	71.0	68.0	66.2	61.1
16/10/2014	09:00:00	70.4	88.6	57.0	60.7	61.9	60.7	63.2	67.8	67.0	67.5
16/10/2014	09:15:00	72.1	97.5	56.2	55.5	55.2	58.0	59.3	64.8	64.1	66.6
16/10/2014	09:30:00	78.7	109.5	55.8	55.2	54.6	55.6	58.9	62.9	61.7	63.4
16/10/2014	09:45:00	66.9	89.7	55.5	56.8	63.9	55.8	59.4	60.5	58.7	59.5
16/10/2014	09:59:00	66.7	84.1	57.0	57.8	64.7	61.6	68.3	64.0	62.9	59.4
16/10/2014	10:15:00	69.7	93.5	55.0	55.4	55.2	58.3	56.6	62.1	64.7	63.5
16/10/2014	10:30:00	69.2	92.3	55.6	57.5	58.3	59.6	59.9	63.4	62.6	64.1

16/10/2014	10:44:00	63.3	83.9	54.4	55.4	56.4	57.1	56.9	63.8	60.6	62.6
16/10/2014	11:00:00	69.7	86.8	59.7	58.5	58.8	62.6	61.7	65.0	63.2	62.9
16/10/2014	11:15:00	67.8	88.7	55.1	55.3	55.8	58.4	59.4	62.8	64.1	66.5
16/10/2014	11:29:00	69.0	87.0	56.8	58.6	59.2	59.6	70.4	66.0	64.3	61.6
16/10/2014	11:45:00	64.9	86.6	54.3	57.3	58.4	60.5	59.1	61.6	62.4	65.7
16/10/2014	12:00:00	66.9	86.3	55.8	55.3	55.0	57.4	57.6	60.4	65.8	65.1
16/10/2014	12:15:00	69.2	91.2	55.8	56.1	57.5	59.4	59.6	69.7	66.3	62.0
16/10/2014	12:30:00	65.7	86.7	56.0	55.0	55.3	56.3	58.1	61.1	57.9	60.3
16/10/2014	12:45:00	63.5	81.6	54.5	54.5	54.3	56.2	57.6	63.0	60.6	63.4
16/10/2014	13:00:00	67.4	87.6	55.6	55.9	56.0	58.5	59.0	60.4	60.4	57.7
16/10/2014	13:15:00	67.6	90.7	54.4	54.1	53.9	56.3	56.9	62.0	60.9	63.9
16/10/2014	13:30:00	66.7	88.3	54.8	53.8	54.2	53.6	57.6	62.6	63.2	66.2
16/10/2014	13:45:00	62.7	82.1	53.0	52.6	52.6	53.6	56.5	60.9	60.6	61.0
16/10/2014	14:00:00	68.9	88.4	55.9	57.0	56.2	59.3	60.3	62.2	60.7	59.9
16/10/2014	14:15:00	69.9	94.4	55.9	55.4	55.8	58.6	57.0	61.9	62.3	65.8
16/10/2014	14:30:00	70.7	95.1	57.7	57.6	59.4	65.4	64.5	64.5	62.0	64.8
16/10/2014	14:44:00	68.0	99.2	55.4	55.6	54.4	57.8	63.3	62.9	60.1	65.5
16/10/2014	15:00:00	67.7	89.4	54.7	55.0	55.2	58.1	58.5	63.0	58.9	57.3
16/10/2014	15:15:00	68.3	92.8	55.4	54.8	55.9	57.9	59.4	65.1	64.0	67.5
16/10/2014	15:30:00	68.8	97.4	53.6	54.1	53.8	56.5	56.2	56.1	55.2	55.3
16/10/2014	15:44:00	62.6	83.4	52.4	52.6	52.9	55.7	55.0	60.4	60.8	62.4
16/10/2014	16:00:00	67.5	84.9	54.3	55.4	56.9	57.4	59.0	62.9	62.5	63.1
16/10/2014	16:15:00	71.0	96.2	57.3	57.1	57.2	57.5	63.8	62.5	64.1	65.5
16/10/2014	16:30:00	66.8	84.9	56.3	56.3	59.8	60.5	60.5	65.1	63.7	64.7
16/10/2014	16:45:00	62.4	85.6	53.9	53.2	53.3	55.8	54.1	58.1	61.1	62.5
16/10/2014	17:00:00	67.7	87.8	55.9	56.8	57.2	61.0	59.5	64.3	63.6	64.2
16/10/2014	17:15:00	70.4	91.3	56.0	57.2	57.7	59.6	59.9	66.1	69.6	66.0
16/10/2014	17:30:00	67.7	88.3	55.5	56.0	55.5	60.9	62.6	61.2	61.5	57.9
16/10/2014	17:45:00	69.1	91.8	54.1	57.2	56.2	61.2	59.4	61.4	61.2	66.8
16/10/2014	18:00:00	68.0	85.8	55.2	55.2	54.8	58.5	59.6	61.9	60.1	58.4
16/10/2014	18:15:00	71.5	93.3	55.7	55.8	57.0	56.9	58.8	62.5	63.4	66.6
16/10/2014	18:30:00	70.0	95.4	54.6	55.2	56.9	56.7	58.5	61.8	66.9	63.2
16/10/2014	18:45:00	67.8	89.9	54.4	53.5	54.0	53.2	57.5	59.3	58.9	63.9
16/10/2014	19:00:00	69.9	95.4	54.2	55.9	54.8	58.1	58.3	62.9	58.9	64.0
16/10/2014	19:15:00	67.9	88.7	52.8	53.2	53.6	55.1	56.7	60.8	62.0	63.8
16/10/2014	19:29:00	67.3	92.1	52.4	52.1	56.7	54.8	57.1	59.7	62.0	64.8
16/10/2014	19:45:00	64.0	86.1	52.1	52.1	51.8	51.4	54.1	57.4	57.7	60.0
16/10/2014	20:00:00	68.8	93.5	53.8	54.9	55.6	54.8	59.0	65.6	60.2	64.7
16/10/2014	20:15:00	65.0	87.7	51.6	51.5	52.0	51.6	55.6	59.8	61.3	62.4
16/10/2014	20:30:00	67.1	89.7	54.9	52.3	52.0	52.0	56.7	58.4	56.6	56.8
16/10/2014	20:45:00	65.9	88.0	51.4	50.9	50.8	50.6	53.5	59.5	59.9	62.6
16/10/2014	21:00:00	65.8	87.4	55.5	56.4	54.7	57.2	57.4	59.8	59.6	58.8
16/10/2014	21:15:00	63.4	84.1	51.4	51.0	51.3	51.4	55.5	61.6	58.5	60.5
16/10/2014	21:30:00	66.6	85.2	52.9	51.9	54.1	51.9	56.2	61.1	61.6	63.7

16/10/2014	21:45:00	64.9	89.8	54.1	55.0	67.2	56.1	68.3	64.6	65.1	63.7
16/10/2014	22:00:00	66.7	92.8	52.0	52.4	51.9	53.5	52.8	58.4	63.5	57.3
16/10/2014	22:15:00	63.9	81.3	52.0	57.4	57.0	61.6	63.7	66.6	64.3	66.0
16/10/2014	22:30:00	64.0	88.8	50.5	50.2	49.0	53.1	50.9	54.0	54.8	56.0
16/10/2014	22:45:00	69.6	92.1	53.3	54.4	54.8	55.0	59.6	64.0	62.9	64.4
16/10/2014	23:00:00	62.1	85.0	49.1	48.9	49.2	47.6	50.7	56.3	59.1	61.5
16/10/2014	23:15:00	66.9	91.3	50.6	51.0	50.2	48.8	53.2	55.8	58.3	54.9
16/10/2014	23:30:00	61.8	79.6	55.7	51.7	53.2	57.4	60.4	63.5	61.7	66.2
16/10/2014	23:45:00	61.9	82.7	49.5	48.6	48.4	46.5	47.8	52.1	50.9	52.7
16/10/2014	23:59:00	61.7	81.5	50.8	49.4	48.1	52.8	56.0	60.8	57.0	56.8
17/10/2014	00:15:00	65.1	88.1	49.4	49.1	49.3	48.1	52.9	53.0	52.3	52.3
17/10/2014	00:30:00	39.8	50.2	45.5	44.3	43.2	41.0	41.9	42.4	42.1	41.1
17/10/2014	00:45:00	62.3	86.1	47.6	47.1	47.5	44.3	45.0	48.7	46.9	48.4
17/10/2014	01:00:00	34.9	49.0	42.0	42.3	42.1	39.6	39.8	41.3	40.0	38.2
17/10/2014	01:15:00	50.2	70.8	44.1	43.8	43.5	41.2	42.7	45.8	46.4	46.1
17/10/2014	01:30:00	43.8	63.7	41.1	42.5	42.3	38.8	39.4	44.0	45.5	44.3
17/10/2014	01:45:00	46.5	70.2	41.4	44.0	43.0	43.0	40.0	42.2	44.1	43.8
17/10/2014	02:00:00	36.8	54.7	40.5	42.4	43.2	42.0	40.7	42.3	43.0	41.6
17/10/2014	02:15:00	35.7	54.7	40.5	42.9	42.1	39.8	39.6	41.2	42.5	41.5
17/10/2014	02:30:00	54.2	77.1	43.1	43.7	43.8	41.8	42.6	45.1	45.7	45.9
17/10/2014	02:45:00	38.1	57.2	42.9	44.0	44.0	41.1	40.6	41.8	42.0	41.3
17/10/2014	03:00:00	55.1	77.4	44.8	44.5	44.8	50.6	51.3	54.2	55.4	59.1
17/10/2014	03:15:00	57.1	83.1	49.1	45.9	46.9	46.0	52.7	55.3	56.2	62.5
17/10/2014	03:30:00	56.8	79.1	43.8	44.9	46.4	43.9	44.5	47.1	48.2	47.7
17/10/2014	03:45:00	38.6	63.4	40.7	41.6	42.3	39.5	39.2	41.3	42.4	41.6
17/10/2014	04:00:00	54.1	77.1	47.9	46.0	44.9	43.4	45.1	46.2	46.1	45.9
17/10/2014	04:15:00	36.5	49.7	40.9	42.4	42.2	39.9	40.3	42.6	43.0	42.3
17/10/2014	04:30:00	55.8	79.5	44.1	45.0	45.0	44.3	44.2	45.8	47.3	49.2
17/10/2014	04:44:00	59.3	82.3	47.5	47.8	61.4	54.3	47.3	49.9	50.7	51.0
17/10/2014	05:00:00	47.6	72.0	42.7	43.8	43.1	40.8	40.9	42.8	44.1	44.1
17/10/2014	05:15:00	58.1	78.9	47.2	49.8	46.6	48.9	50.2	50.8	63.6	51.6
17/10/2014	05:30:00	64.5	85.1	52.2	50.7	52.1	54.9	55.6	58.9	59.5	61.1
17/10/2014	05:44:00	63.0	84.8	52.3	49.7	49.6	49.6	55.8	58.6	59.6	65.5
17/10/2014	06:00:00	62.8	82.3	51.7	51.3	51.0	51.7	54.8	61.8	61.2	63.4
17/10/2014	06:15:00	66.1	91.9	49.8	50.3	49.5	48.2	50.6	52.0	51.7	52.5
17/10/2014	06:29:00	63.9	84.7	51.5	51.3	51.0	50.6	55.0	55.9	55.4	55.3
17/10/2014	06:45:00	63.3	85.8	51.3	52.0	52.3	51.9	55.2	58.7	60.3	62.0
17/10/2014	07:00:00	65.3	89.1	52.5	53.2	53.4	54.4	55.5	58.2	64.2	60.4
17/10/2014	07:15:00	63.5	82.5	53.8	53.3	53.4	52.8	57.0	63.0	57.7	59.8
17/10/2014	07:30:00	66.6	85.2	54.6	56.8	55.1	58.0	60.0	64.5	65.3	67.0
17/10/2014	07:45:00	65.9	90.0	52.3	52.7	52.3	52.7	53.9	54.9	53.4	55.7
17/10/2014	08:00:00	73.8	105.3	53.7	55.6	54.0	54.9	60.2	64.3	59.6	58.8
17/10/2014	08:14:00	67.4	88.6	55.4	54.7	55.7	59.0	58.0	62.3	60.6	64.8
17/10/2014	08:30:00	70.2	98.1	55.0	57.5	56.9	60.7	60.6	65.6	63.0	63.6

17/10/2014	08:45:00	66.5	84.8	53.6	57.6	57.2	56.8	62.2	72.9	69.2	61.1
17/10/2014	09:00:00	73.4	102.3	56.1	56.7	57.9	57.1	59.8	64.1	64.5	66.3
17/10/2014	09:15:00	67.8	88.5	55.5	55.8	55.5	57.6	59.2	65.7	68.8	65.4
17/10/2014	09:30:00	66.7	84.0	54.8	54.4	54.8	54.2	57.9	61.5	61.8	63.1
17/10/2014	09:45:00	66.5	88.6	53.0	53.5	53.8	57.5	55.6	56.5	54.5	58.5
17/10/2014	10:00:00	66.3	84.4	55.6	57.2	56.7	60.5	59.9	63.1	60.9	62.4
17/10/2014	10:15:00	67.0	86.5	55.8	56.6	56.3	58.0	63.6	72.5	67.8	62.8
17/10/2014	10:30:00	66.0	87.0	56.0	57.4	58.2	63.1	58.7	62.4	60.8	56.7
17/10/2014	10:45:00	65.3	92.7	54.1	54.1	54.5	58.0	55.9	62.1	58.7	60.1
17/10/2014	11:00:00	68.8	93.1	55.9	56.6	56.6	57.5	57.9	60.0	63.7	65.3
17/10/2014	11:14:00	68.9	90.9	60.2	57.7	57.6	66.3	63.0	66.7	62.0	65.8
17/10/2014	11:30:00	68.6	85.5	56.8	64.3	60.0	62.0	61.7	66.2	63.0	62.5
17/10/2014	11:45:00	65.7	90.3	53.8	54.4	54.7	56.3	58.8	62.1	61.3	63.5
17/10/2014	12:00:00	68.0	87.0	55.6	57.3	55.9	58.7	59.9	63.6	60.3	56.8
17/10/2014	12:15:00	69.5	95.7	55.5	55.3	56.5	58.1	60.8	64.7	65.5	68.7
17/10/2014	12:30:00	65.8	85.3	56.0	55.9	56.3	58.9	57.6	58.3	56.8	57.0
17/10/2014	12:44:00	63.5	82.5	54.3	54.3	54.4	56.7	55.9	61.0	62.9	64.5
17/10/2014	13:00:00	67.7	87.1	57.3	58.4	57.3	59.0	60.9	67.2	59.4	57.1
17/10/2014	13:15:00	68.1	90.7	56.4	55.1	54.9	60.0	57.0	60.4	60.4	63.0

Position B: Commercial Unit

Date	Time	L_{Aeq}	L_{Amax}	L_{Aeq}							
				63	125	250	500	1k	2k	4k	8k
14/10/2014	16:45:00	60.5	78.6	48.3	50.1	53.7	56.8	60.9	63.4	62.8	58.7
14/10/2014	17:00:00	61.4	78.9	50.2	54.1	60.0	66.8	64.3	64.3	63.8	60.1
14/10/2014	17:15:00	58.6	77.9	49.1	53.1	54.8	56.6	59.0	60.7	60.4	56.4
14/10/2014	17:30:00	58.8	83.3	48.1	50.2	53.6	56.7	59.1	61.2	62.2	57.2
14/10/2014	17:45:00	58.8	76.9	48.0	49.9	54.5	56.7	59.2	62.1	62.1	59.6
14/10/2014	18:00:00	56.9	72.1	49.5	52.1	54.7	60.7	64.5	64.0	62.2	56.9
14/10/2014	18:15:00	55.9	70.9	47.5	50.1	52.2	56.5	59.1	60.4	62.1	58.9
14/10/2014	18:30:00	54.9	74.6	47.7	49.0	52.9	56.8	61.8	60.0	58.8	56.5
14/10/2014	18:45:00	57.4	82.6	47.8	49.7	53.4	57.9	63.5	64.0	63.2	59.5
14/10/2014	19:00:00	55.4	72.1	48.0	51.6	55.3	57.1	60.8	62.6	62.2	57.4
14/10/2014	19:15:00	57.5	76.3	47.9	50.8	53.3	61.4	61.1	64.1	63.1	58.5
14/10/2014	19:30:00	54.6	67.8	46.4	49.8	52.9	58.3	59.5	60.1	58.8	55.6
14/10/2014	19:45:00	54.4	70.2	44.9	45.8	49.1	54.1	58.2	60.2	59.8	54.6
14/10/2014	20:00:00	54.2	72.7	45.7	46.5	49.7	53.7	58.0	59.7	60.4	58.0
14/10/2014	20:15:00	54.2	78.9	46.9	49.7	51.1	53.9	58.8	60.8	61.2	55.3
14/10/2014	20:30:00	53.0	71.0	46.2	47.4	51.8	56.4	58.3	59.4	59.9	57.4
14/10/2014	20:45:00	54.2	66.8	47.1	50.8	53.9	55.6	57.5	61.2	60.6	55.9
14/10/2014	21:00:00	54.7	74.2	45.5	48.7	49.9	52.9	59.0	60.5	59.0	55.4
14/10/2014	21:15:00	54.2	75.4	45.6	46.1	47.9	52.2	56.2	59.2	60.7	56.7
14/10/2014	21:30:00	52.1	70.5	46.3	46.8	48.4	52.4	55.7	54.5	55.0	52.2

14/10/2014	21:45:00	52.4	69.9	45.1	45.8	48.9	53.0	54.1	51.8	55.3	53.2
14/10/2014	22:00:00	51.8	66.7	45.1	48.0	52.4	55.2	59.2	59.1	60.7	53.6
14/10/2014	22:14:00	51.8	67.9	45.8	47.8	50.3	53.0	53.4	54.1	55.7	53.1
14/10/2014	22:30:00	52.6	69.2	44.5	44.5	48.2	53.0	54.7	57.8	56.1	58.7
14/10/2014	22:45:00	48.1	66.7	44.7	45.7	45.8	51.5	52.0	52.5	49.6	46.7
14/10/2014	23:00:00	53.0	71.8	43.4	46.3	51.3	52.3	59.7	59.0	57.2	57.1
14/10/2014	23:15:00	51.3	69.1	43.3	44.0	47.7	51.5	51.3	55.3	57.1	58.1
14/10/2014	23:30:00	48.6	68.2	43.1	43.6	45.1	49.6	49.6	49.8	50.2	44.1
14/10/2014	23:45:00	48.4	67.3	43.1	43.3	46.0	50.5	55.2	58.3	55.2	43.3
15/10/2014	00:00:00	45.1	65.1	42.8	44.3	46.7	48.1	51.9	51.5	48.0	45.0
15/10/2014	00:14:00	50.1	72.5	43.3	44.4	47.3	49.0	56.0	62.3	61.8	55.0
15/10/2014	00:30:00	49.9	69.3	41.7	43.1	45.4	47.1	52.0	53.6	56.1	53.1
15/10/2014	00:45:00	46.3	67.4	41.2	44.1	47.3	51.9	56.3	52.3	53.4	52.3
15/10/2014	01:00:00	47.3	67.1	37.5	39.2	42.8	47.5	49.8	56.6	50.9	47.6
15/10/2014	01:15:00	45.8	64.9	37.3	38.3	41.5	45.2	46.3	51.0	52.6	47.6
15/10/2014	01:30:00	46.4	63.9	39.2	41.9	45.5	50.2	49.8	56.0	58.0	51.7
15/10/2014	01:45:00	44.2	64.6	36.8	39.3	43.2	46.0	51.2	54.6	52.0	44.7
15/10/2014	02:00:00	46.2	67.8	46.5	47.5	47.4	49.0	48.5	51.4	51.1	49.2
15/10/2014	02:14:00	45.6	68.7	38.7	40.8	43.6	45.9	44.1	44.6	47.7	44.9
15/10/2014	02:30:00	43.9	63.8	39.1	41.5	44.4	46.2	44.0	49.7	49.3	39.4
15/10/2014	02:45:00	42.6	65.2	37.7	39.5	43.2	53.0	48.6	46.8	50.6	43.5
15/10/2014	03:00:00	45.0	66.3	37.0	38.2	43.2	54.3	46.4	46.5	48.0	43.3
15/10/2014	03:15:00	39.3	54.4	42.4	41.7	43.5	54.0	45.4	43.5	43.6	42.6
15/10/2014	03:30:00	44.7	67.6	40.3	40.5	43.1	53.7	54.8	51.0	44.1	40.6
15/10/2014	03:45:00	48.2	70.9	39.2	41.2	41.2	53.2	45.8	50.0	57.3	55.3
15/10/2014	04:00:00	48.7	70.2	43.4	46.9	45.8	49.3	51.7	58.5	57.0	52.9
15/10/2014	04:15:00	42.9	63.8	39.7	39.8	42.4	45.5	45.8	44.0	47.4	45.3
15/10/2014	04:30:00	43.9	66.2	37.7	38.2	42.6	44.9	47.9	48.5	48.8	44.0
15/10/2014	04:45:00	46.1	67.1	41.0	42.8	43.3	46.0	48.0	46.1	53.9	45.5
15/10/2014	04:59:00	42.6	64.2	39.2	39.7	40.4	42.6	44.9	48.3	46.1	47.2
15/10/2014	05:15:00	46.3	63.9	42.3	42.4	45.2	46.2	48.3	52.1	53.8	45.4
15/10/2014	05:30:00	47.3	64.2	43.1	44.3	46.3	51.3	54.2	54.4	55.2	51.1
15/10/2014	05:45:00	48.1	66.7	44.8	43.4	45.2	47.4	51.3	51.7	50.4	48.3
15/10/2014	05:59:00	50.4	69.2	43.7	43.5	45.6	47.9	50.4	53.7	56.0	52.7
15/10/2014	06:15:00	48.7	68.3	43.0	43.3	44.6	51.1	50.8	52.5	51.5	48.6
15/10/2014	06:30:00	52.0	68.1	44.9	45.6	49.0	53.2	55.9	59.0	58.0	54.0
15/10/2014	06:45:00	57.0	76.8	52.3	52.9	54.0	57.3	61.2	62.9	64.1	59.8
15/10/2014	07:00:00	54.0	70.7	47.5	50.2	52.3	55.6	58.1	61.4	62.6	59.1
15/10/2014	07:15:00	57.1	73.2	48.3	51.6	53.5	56.4	60.0	62.2	62.4	61.4
15/10/2014	07:30:00	57.6	73.1	49.6	52.7	55.0	57.1	59.9	64.1	63.9	60.3
15/10/2014	07:45:00	57.8	71.8	51.1	56.0	57.4	64.0	63.1	64.7	65.3	60.9
15/10/2014	08:00:00	58.8	73.5	53.2	55.9	57.8	60.3	62.3	66.4	65.9	60.4
15/10/2014	08:14:00	58.9	73.5	52.6	54.4	55.9	58.1	61.9	63.5	63.2	60.0
15/10/2014	08:30:00	58.2	74.9	54.0	56.0	67.2	61.1	64.0	65.9	63.7	60.3

15/10/2014	08:45:00	60.4	78.1	52.2	54.9	61.9	60.1	62.1	64.8	66.0	62.8
15/10/2014	09:00:00	59.9	75.5	51.0	55.4	59.1	62.3	64.1	65.2	63.5	59.7
15/10/2014	09:15:00	59.1	75.9	49.2	53.0	55.6	58.4	62.5	62.6	63.6	60.3
15/10/2014	09:30:00	59.6	75.7	51.6	54.5	57.0	60.1	65.0	66.6	66.4	61.1
15/10/2014	09:45:00	59.3	76.6	50.1	51.7	55.6	59.8	61.0	62.7	64.0	57.9
15/10/2014	10:00:00	59.3	76.8	49.7	52.7	56.4	59.7	60.1	60.6	61.7	59.4
15/10/2014	10:15:00	59.5	77.1	49.6	52.4	54.9	57.8	59.3	61.7	62.2	60.2
15/10/2014	10:30:00	60.0	80.3	53.1	58.7	62.1	60.2	62.8	63.0	63.0	61.7
15/10/2014	10:44:00	59.9	77.8	51.2	53.9	56.0	61.4	62.8	64.8	68.6	63.3
15/10/2014	11:00:00	59.6	78.1	52.0	55.5	58.3	62.2	63.3	66.4	66.6	63.8
15/10/2014	11:15:00	60.0	78.4	51.4	55.1	57.4	59.5	62.0	63.8	64.5	59.9
15/10/2014	11:30:00	58.9	78.1	51.0	53.8	57.7	62.0	62.9	60.9	63.1	59.1
15/10/2014	11:45:00	59.1	77.7	49.8	52.5	55.0	59.6	61.2	59.5	60.5	59.6
15/10/2014	12:00:00	58.6	78.1	50.1	54.2	55.3	58.2	61.0	60.9	60.0	59.3
15/10/2014	12:15:00	61.4	78.1	51.4	54.2	57.5	59.1	60.0	62.3	62.0	61.9
15/10/2014	12:30:00	60.7	77.8	52.5	56.3	57.0	58.9	61.0	62.4	63.8	61.2
15/10/2014	12:45:00	60.7	77.0	50.7	54.4	57.5	60.2	65.4	63.5	62.7	60.1
15/10/2014	13:00:00	59.2	78.3	52.7	55.9	59.2	59.8	61.0	61.4	62.6	58.2
15/10/2014	13:15:00	59.1	77.1	51.0	53.4	55.3	60.7	61.9	64.3	64.6	60.8
15/10/2014	13:30:00	60.7	79.4	53.7	55.6	58.1	60.7	61.6	62.6	64.0	61.9
15/10/2014	13:45:00	58.5	77.3	53.4	56.4	60.0	59.2	60.6	63.1	62.8	59.5
15/10/2014	14:00:00	60.8	78.0	51.1	53.4	56.6	59.5	63.1	62.7	64.7	61.5
15/10/2014	14:15:00	59.9	78.2	50.1	52.9	54.5	57.2	59.8	60.6	61.5	59.7
15/10/2014	14:30:00	61.2	78.5	53.0	55.3	57.5	59.7	62.7	64.5	66.2	61.4
15/10/2014	14:45:00	60.2	78.1	49.5	52.6	56.0	61.0	63.6	62.2	61.5	58.1
15/10/2014	15:00:00	59.6	77.8	52.6	55.4	57.4	59.2	61.1	63.2	62.3	59.5
15/10/2014	15:15:00	59.9	77.8	52.6	55.6	56.5	58.8	61.9	61.9	62.6	59.7
15/10/2014	15:30:00	59.6	77.0	52.6	55.9	67.9	61.7	63.9	64.8	64.1	59.5
15/10/2014	15:45:00	58.9	77.7	49.0	52.7	55.5	56.8	61.0	62.1	62.2	56.7
15/10/2014	15:59:00	60.6	78.1	52.5	55.8	57.2	59.9	62.0	63.6	63.7	58.5
15/10/2014	16:15:00	59.0	77.7	53.1	56.6	58.6	64.1	62.9	62.6	63.9	59.3
15/10/2014	16:30:00	59.5	77.9	49.4	52.2	54.8	57.2	62.1	63.0	59.7	55.9
15/10/2014	16:44:00	60.7	78.6	49.8	50.6	54.4	58.9	60.0	62.4	61.7	58.1
15/10/2014	17:00:00	59.8	77.5	51.3	53.9	54.7	58.4	61.8	60.9	60.6	61.1
15/10/2014	17:15:00	62.3	81.9	51.2	53.7	57.3	61.3	62.8	65.1	64.4	63.1
15/10/2014	17:30:00	67.6	92.9	49.8	52.3	55.6	59.2	62.4	62.3	61.8	59.3
15/10/2014	17:45:00	59.3	79.2	49.7	53.5	54.5	58.7	61.3	60.1	60.8	57.7
15/10/2014	18:00:00	59.1	78.6	50.8	52.8	55.1	59.0	61.2	62.6	63.3	60.1
15/10/2014	18:15:00	58.7	74.2	49.8	51.4	53.5	59.4	61.5	62.2	62.4	59.5
15/10/2014	18:30:00	65.1	77.6	48.9	50.3	54.5	60.7	62.1	62.2	61.7	58.9
15/10/2014	18:45:00	70.3	76.6	47.4	49.8	55.4	58.3	62.0	62.3	62.1	58.5
15/10/2014	19:00:00	69.6	79.5	47.1	48.8	51.6	56.5	59.9	64.4	62.3	59.9
15/10/2014	19:14:00	64.6	76.4	49.2	52.2	54.9	58.2	61.5	61.0	60.7	58.3
15/10/2014	19:30:00	61.5	71.9	48.1	49.9	52.1	57.5	59.2	61.4	61.1	56.2

15/10/2014	19:44:00	57.3	72.6	48.1	48.7	52.4	57.5	59.5	60.0	60.5	58.4
15/10/2014	20:00:00	58.4	74.3	50.1	53.3	55.1	58.3	62.1	62.5	61.8	58.1
15/10/2014	20:15:00	55.0	71.1	48.9	49.6	51.7	56.0	59.2	60.2	61.1	54.6
15/10/2014	20:30:00	55.7	67.9	46.7	48.6	51.7	55.6	57.9	60.7	62.4	58.4
15/10/2014	20:44:00	56.1	68.8	46.0	48.4	50.4	53.2	55.7	58.5	60.0	56.7
15/10/2014	21:00:00	57.7	71.9	47.1	49.2	51.8	55.2	57.8	61.0	60.1	54.0
15/10/2014	21:14:00	56.6	75.2	48.7	48.8	51.4	55.7	57.7	59.8	58.8	57.5
15/10/2014	21:30:00	56.3	77.6	46.6	48.1	51.3	54.4	56.9	59.0	59.0	62.6
15/10/2014	21:45:00	56.9	72.0	50.7	51.2	54.4	57.5	57.8	60.7	60.2	57.2
15/10/2014	22:00:00	55.2	72.4	48.2	50.7	52.0	54.7	58.6	60.7	63.6	62.8
15/10/2014	22:15:00	53.4	66.4	46.8	48.7	51.2	54.0	58.4	59.2	58.9	53.7
15/10/2014	22:30:00	59.0	80.0	50.0	50.7	55.0	56.6	58.4	61.6	62.5	58.6
15/10/2014	22:45:00	66.5	75.9	45.9	47.5	53.7	56.0	62.3	60.2	59.7	54.0
15/10/2014	23:00:00	65.6	77.8	45.0	49.1	56.3	56.3	57.4	60.6	60.5	55.5
15/10/2014	23:15:00	55.6	79.1	45.3	46.2	48.4	57.0	65.2	54.9	56.1	52.3
15/10/2014	23:30:00	51.9	68.3	45.8	48.1	51.6	53.1	58.2	59.5	55.8	51.8
15/10/2014	23:45:00	66.2	74.8	43.7	44.7	46.1	54.4	62.5	61.8	59.3	54.8
16/10/2014	00:00:00	59.2	82.4	45.3	45.6	50.7	53.8	56.5	60.2	60.7	57.9
16/10/2014	00:15:00	51.4	72.4	45.9	49.5	50.4	52.3	55.3	57.0	58.8	49.6
16/10/2014	00:30:00	51.6	68.2	43.8	44.5	47.8	51.3	53.2	54.8	54.5	51.8
16/10/2014	00:44:00	49.6	66.3	42.4	43.7	45.4	50.3	56.3	57.3	57.9	52.1
16/10/2014	01:00:00	47.2	67.0	40.3	42.5	45.6	48.8	54.2	57.0	56.7	46.4
16/10/2014	01:15:00	42.4	68.2	37.0	38.0	40.6	42.0	42.2	43.6	44.7	37.8
16/10/2014	01:30:00	44.1	62.4	38.7	40.8	42.1	48.1	48.2	54.3	54.1	42.5
16/10/2014	01:45:00	48.5	66.9	40.2	43.5	45.1	48.0	50.8	54.4	53.1	48.4
16/10/2014	02:00:00	43.6	66.6	47.6	45.5	44.4	47.8	46.6	48.2	45.9	42.8
16/10/2014	02:15:00	48.0	68.5	42.9	42.6	46.2	48.1	49.5	49.7	49.1	48.2
16/10/2014	02:30:00	44.5	64.3	42.3	44.7	48.4	48.4	49.9	48.7	55.2	47.6
16/10/2014	02:45:00	43.3	64.5	40.9	40.0	42.9	44.3	51.4	47.5	46.4	50.2
16/10/2014	02:59:00	45.0	65.8	39.7	40.3	44.8	49.0	49.7	52.9	50.1	45.5
16/10/2014	03:15:00	46.2	69.5	44.3	43.8	47.7	49.3	45.4	44.9	45.0	39.4
16/10/2014	03:30:00	50.1	67.8	41.5	44.2	47.1	48.9	56.2	57.2	54.6	46.0
16/10/2014	03:45:00	45.8	63.9	38.1	39.7	42.1	44.0	44.4	49.3	50.6	42.2
16/10/2014	04:00:00	41.4	54.8	42.4	43.7	44.5	52.7	46.7	43.6	44.3	40.9
16/10/2014	04:15:00	45.0	64.9	45.4	49.5	47.2	53.9	49.5	56.6	48.7	44.3
16/10/2014	04:30:00	46.9	64.7	40.2	42.0	44.1	53.8	47.1	50.6	54.6	51.7
16/10/2014	04:45:00	43.4	60.8	39.9	41.2	43.2	53.7	48.3	46.4	50.3	42.4
16/10/2014	05:00:00	43.1	65.3	39.4	40.0	42.8	53.3	52.1	48.2	44.3	41.0
16/10/2014	05:14:00	45.7	63.1	42.5	43.5	45.4	53.7	51.4	52.5	53.9	49.4
16/10/2014	05:30:00	44.9	66.6	43.5	43.2	44.7	53.7	48.4	49.8	50.5	44.3
16/10/2014	05:45:00	47.2	64.8	43.7	44.0	46.3	52.8	49.2	50.2	49.9	45.7
16/10/2014	05:59:00	49.6	67.2	45.5	45.3	48.3	51.9	52.3	54.1	54.0	54.4
16/10/2014	06:15:00	52.6	69.8	46.7	50.8	49.6	55.0	55.9	58.6	59.4	57.0
16/10/2014	06:30:00	50.9	67.5	46.0	46.5	48.4	51.3	53.2	56.6	59.0	55.3

16/10/2014	06:44:00	52.0	72.4	49.4	52.2	51.9	53.7	56.0	59.9	59.5	54.2
16/10/2014	07:00:00	56.1	70.8	49.9	51.1	52.8	56.3	58.6	61.2	60.3	57.8
16/10/2014	07:15:00	54.7	70.6	49.9	52.5	54.9	57.2	59.0	60.9	60.3	58.6
16/10/2014	07:30:00	57.7	71.6	50.0	52.3	54.3	57.8	61.2	62.7	61.7	58.4
16/10/2014	07:45:00	57.3	71.1	51.0	54.3	54.8	62.4	63.4	63.3	61.8	58.7
16/10/2014	08:00:00	60.0	76.7	51.7	54.8	55.3	59.9	64.7	67.3	66.3	62.1
16/10/2014	08:15:00	60.2	76.0	54.0	55.9	57.2	60.6	62.8	65.0	65.6	60.1
16/10/2014	08:30:00	60.8	84.1	53.2	55.5	57.1	63.3	67.7	66.2	66.4	62.1
16/10/2014	08:45:00	61.2	78.2	51.4	53.5	57.0	60.9	64.6	66.0	66.3	61.9
16/10/2014	09:00:00	60.2	76.9	55.5	58.7	59.8	66.9	66.4	65.2	64.3	59.2
16/10/2014	09:15:00	60.5	78.2	54.2	56.4	58.9	61.0	63.7	63.2	61.3	58.5
16/10/2014	09:29:00	59.3	77.5	52.5	54.9	57.7	60.5	64.3	67.3	65.3	60.0
16/10/2014	09:45:00	59.5	77.9	52.2	54.9	57.9	59.5	62.5	63.7	63.1	60.8
16/10/2014	10:00:00	59.4	81.3	50.2	52.8	54.8	57.9	61.8	65.5	62.8	58.2
16/10/2014	10:15:00	59.0	77.2	50.1	52.8	54.8	58.0	62.0	62.1	61.3	57.8
16/10/2014	10:30:00	60.4	77.5	52.2	54.3	57.3	60.9	63.8	64.3	63.4	61.0
16/10/2014	10:45:00	58.8	77.7	52.2	55.0	57.2	59.6	62.0	60.5	61.2	58.0
16/10/2014	10:59:00	59.9	77.8	51.2	53.3	55.1	57.3	60.8	62.3	61.8	57.9
16/10/2014	11:15:00	58.7	78.1	51.4	54.0	57.3	58.3	60.7	61.9	62.4	60.0
16/10/2014	11:30:00	58.8	77.9	52.0	53.9	56.5	58.0	61.2	60.5	59.5	56.2
16/10/2014	11:45:00	60.6	77.4	53.3	55.2	57.7	60.9	64.0	64.5	64.6	61.3
16/10/2014	12:00:00	61.7	77.9	54.1	55.8	57.7	60.3	64.8	66.0	66.3	62.0
16/10/2014	12:15:00	59.5	77.4	52.3	53.1	56.0	59.7	61.9	62.1	62.8	60.3
16/10/2014	12:30:00	59.0	78.2	53.5	54.6	57.0	63.2	64.3	65.7	64.4	57.7
16/10/2014	12:44:00	60.0	77.4	53.0	55.3	57.5	59.8	63.2	63.8	63.1	59.4
16/10/2014	13:00:00	62.1	80.0	53.5	55.6	58.0	68.8	63.2	63.8	63.0	58.7
16/10/2014	13:15:00	60.6	78.1	51.7	53.9	56.9	58.7	61.3	63.0	62.9	58.8
16/10/2014	13:30:00	58.3	77.1	54.1	54.9	57.1	60.9	62.7	63.3	63.6	59.2
16/10/2014	13:45:00	59.3	77.2	48.9	51.0	54.1	58.3	61.5	62.0	62.5	58.7
16/10/2014	14:00:00	61.0	77.4	51.9	53.6	55.8	58.5	61.5	62.4	61.9	57.8
16/10/2014	14:14:00	61.2	77.5	54.3	55.6	56.9	60.0	63.4	64.3	63.1	63.1
16/10/2014	14:30:00	62.5	78.6	53.0	54.1	55.9	58.7	62.9	63.8	62.9	59.4
16/10/2014	14:45:00	67.0	85.5	52.9	56.3	57.1	60.9	64.0	65.5	63.6	58.8
16/10/2014	15:00:00	67.8	78.8	51.8	54.0	58.6	60.4	61.8	65.0	63.2	61.1
16/10/2014	15:15:00	58.5	77.3	52.4	55.4	59.3	64.1	69.3	62.5	61.7	59.6
16/10/2014	15:29:00	58.6	77.2	53.0	55.7	62.2	59.9	62.7	63.6	63.8	58.3
16/10/2014	15:45:00	60.0	77.4	51.3	54.4	57.2	62.8	63.0	64.2	64.7	62.1
16/10/2014	16:00:00	60.7	84.4	50.9	51.9	54.0	60.4	59.8	61.6	62.0	60.3
16/10/2014	16:15:00	61.6	83.1	54.0	56.2	57.5	63.9	63.9	64.1	64.7	62.3
16/10/2014	16:30:00	59.7	78.2	51.3	53.8	57.1	62.9	62.6	63.4	63.4	60.0
16/10/2014	16:45:00	58.5	77.5	53.0	52.9	56.0	57.1	61.8	59.9	60.1	59.3
16/10/2014	17:00:00	59.3	78.4	53.3	54.5	58.2	57.7	59.8	62.5	61.3	57.0
16/10/2014	17:15:00	59.9	81.3	50.5	53.0	55.3	59.1	60.9	60.8	60.7	57.9
16/10/2014	17:30:00	57.1	73.9	51.5	54.0	56.0	58.6	61.9	63.4	63.9	59.3

16/10/2014	17:45:00	57.6	76.3	49.5	51.2	53.6	58.3	59.7	62.5	61.6	58.8
16/10/2014	18:00:00	55.4	75.2	50.7	52.6	55.6	60.2	61.6	60.2	58.2	55.4
16/10/2014	18:14:00	57.0	74.6	50.2	50.8	54.1	59.1	62.2	63.0	61.2	59.1
16/10/2014	18:30:00	56.2	73.0	49.1	50.6	52.6	56.6	58.7	62.3	62.3	57.6
16/10/2014	18:45:00	56.5	75.0	49.5	53.3	58.0	60.1	63.4	65.8	63.3	60.1
16/10/2014	19:00:00	55.4	69.9	50.6	54.0	57.0	59.9	60.2	60.0	59.7	58.3
16/10/2014	19:15:00	55.7	69.9	48.3	50.1	51.9	56.3	57.5	58.4	60.8	61.2
16/10/2014	19:30:00	54.8	73.5	48.5	49.9	55.1	57.5	59.7	60.5	63.3	59.7
16/10/2014	19:44:00	55.3	71.0	50.3	51.1	53.3	56.3	59.0	60.9	60.2	57.7
16/10/2014	20:00:00	54.5	70.4	48.3	51.0	54.0	57.7	59.2	61.1	62.0	57.2
16/10/2014	20:14:00	54.7	73.6	47.3	48.3	52.0	54.7	57.5	62.5	60.0	54.4
16/10/2014	20:30:00	54.2	70.6	49.3	51.8	53.0	54.5	55.8	57.7	60.4	57.7
16/10/2014	20:45:00	54.6	70.7	46.6	47.1	50.7	54.3	56.0	55.8	59.3	55.1
16/10/2014	21:00:00	54.1	72.6	47.7	48.5	52.2	56.0	59.2	61.4	60.1	57.5
16/10/2014	21:15:00	53.3	70.3	45.8	47.3	52.5	53.8	57.0	59.6	60.9	56.2
16/10/2014	21:30:00	54.3	73.5	46.5	47.5	51.1	55.2	57.3	57.0	57.2	56.9
16/10/2014	21:45:00	53.4	67.9	46.3	48.1	52.6	53.5	57.7	61.1	59.8	55.1
16/10/2014	22:00:00	54.1	73.3	45.3	47.0	50.7	53.2	59.6	61.0	59.6	54.4
16/10/2014	22:15:00	52.9	69.2	46.7	48.2	50.6	53.8	55.7	57.9	59.3	55.1
16/10/2014	22:30:00	51.6	66.7	45.8	47.1	49.5	55.6	54.0	56.7	56.7	53.0
16/10/2014	22:45:00	53.8	70.0	47.0	54.5	58.4	53.6	58.7	60.1	55.8	52.0
16/10/2014	23:00:00	54.1	76.1	45.5	46.5	52.0	56.2	60.4	62.3	58.9	53.7
16/10/2014	23:15:00	53.5	69.9	45.6	47.7	51.3	53.8	56.8	57.6	57.8	53.1
16/10/2014	23:30:00	53.0	73.5	46.2	46.6	54.5	58.0	58.5	61.0	60.4	55.3
16/10/2014	23:45:00	52.0	70.3	44.2	44.8	48.6	53.2	56.9	55.3	53.9	49.9
17/10/2014	00:00:00	54.7	71.6	45.5	46.7	47.7	51.1	54.8	57.1	57.8	53.0
17/10/2014	00:15:00	55.0	70.1	49.0	50.4	51.2	53.1	56.1	58.8	55.8	49.1
17/10/2014	00:30:00	53.0	67.2	43.6	45.8	51.3	53.6	56.2	55.6	57.9	53.8
17/10/2014	00:45:00	50.2	67.6	45.5	44.0	44.9	48.2	49.3	48.1	48.2	44.4
17/10/2014	01:00:00	49.2	65.3	40.9	41.8	44.2	47.6	51.5	57.3	54.9	49.3
17/10/2014	01:15:00	49.2	66.5	42.3	42.4	45.8	47.4	49.1	54.0	55.4	47.8
17/10/2014	01:30:00	46.7	65.3	39.1	40.7	43.3	44.7	46.7	48.3	52.6	46.1
17/10/2014	01:45:00	44.7	62.9	39.5	40.3	43.8	47.3	45.6	44.9	46.5	42.2
17/10/2014	02:00:00	45.8	65.8	41.0	42.6	44.5	48.6	46.6	48.8	52.4	49.3
17/10/2014	02:14:00	47.1	64.9	46.0	49.9	47.1	48.0	48.8	49.6	48.5	49.3
17/10/2014	02:30:00	46.1	64.9	41.2	44.8	47.3	46.7	45.8	46.4	48.6	49.4
17/10/2014	02:45:00	46.1	64.9	41.4	42.6	45.9	48.1	47.4	48.0	48.8	43.5
17/10/2014	03:00:00	46.0	62.4	40.4	42.2	44.9	50.2	51.4	52.0	56.7	53.3
17/10/2014	03:15:00	44.2	59.8	44.6	44.4	48.6	47.8	46.0	44.5	44.7	42.5
17/10/2014	03:30:00	45.3	63.4	40.3	41.4	45.2	47.0	54.0	53.6	50.0	45.0
17/10/2014	03:45:00	44.8	64.5	39.8	40.8	43.3	44.9	45.7	48.0	51.9	43.8
17/10/2014	04:00:00	46.0	63.0	44.4	46.5	46.1	48.1	54.2	58.7	48.8	46.5
17/10/2014	04:15:00	49.3	70.1	40.9	41.9	45.2	47.9	47.9	52.6	51.9	48.7
17/10/2014	04:30:00	47.4	65.4	41.1	42.4	45.9	49.9	48.9	52.9	53.0	43.9

17/10/2014	04:45:00	52.8	71.0	41.4	45.5	61.7	59.7	51.0	54.0	56.4	54.1
17/10/2014	05:00:00	47.2	66.5	40.5	41.8	43.5	46.8	48.2	50.2	57.0	53.1
17/10/2014	05:15:00	48.3	65.7	43.3	44.2	45.6	47.4	49.1	54.6	55.8	46.0
17/10/2014	05:30:00	47.8	65.1	44.7	44.8	46.1	49.8	49.7	51.8	52.6	51.9
17/10/2014	05:45:00	47.1	66.7	44.6	45.5	46.7	50.5	50.3	47.5	47.4	46.7
17/10/2014	06:00:00	49.4	66.5	45.6	45.8	48.1	49.2	51.6	52.8	52.1	49.7
17/10/2014	06:15:00	48.7	64.6	45.0	45.7	46.8	49.6	52.4	55.3	54.3	52.0
17/10/2014	06:30:00	51.2	67.8	45.8	46.6	48.7	53.1	56.7	56.2	52.9	50.7
17/10/2014	06:45:00	54.7	74.5	47.3	49.0	52.6	55.5	58.7	59.9	61.9	56.3
17/10/2014	07:00:00	54.6	69.1	48.1	51.1	54.1	59.8	60.3	63.0	61.1	57.4
17/10/2014	07:15:00	56.7	70.5	49.0	51.7	53.7	57.2	60.4	62.7	60.5	56.9
17/10/2014	07:30:00	56.2	70.6	48.7	50.8	53.7	58.7	61.7	62.6	61.3	59.3
17/10/2014	07:44:00	58.9	75.9	50.7	54.9	57.0	70.2	64.1	63.7	67.9	62.4
17/10/2014	08:00:00	59.1	75.8	49.6	52.8	55.1	63.7	63.7	62.2	63.5	59.4
17/10/2014	08:15:00	60.1	76.5	55.0	56.6	58.2	61.7	63.2	65.3	64.7	61.7
17/10/2014	08:30:00	59.2	77.4	50.2	53.0	56.7	61.7	61.9	63.1	62.6	59.3
17/10/2014	08:45:00	59.1	77.4	50.5	53.7	58.4	60.5	64.2	64.9	64.8	61.0
17/10/2014	09:00:00	59.3	77.6	50.6	52.3	56.0	61.7	64.0	65.2	65.4	60.6
17/10/2014	09:15:00	59.5	81.2	51.1	55.1	58.1	60.5	65.3	63.2	62.0	58.2
17/10/2014	09:30:00	58.7	78.2	52.1	53.6	57.1	60.3	64.5	66.0	64.0	60.3
17/10/2014	09:44:00	59.3	77.5	51.5	55.7	58.3	59.9	61.7	63.0	63.9	59.2
17/10/2014	10:00:00	59.3	77.7	51.5	54.0	56.8	61.6	63.9	63.9	63.9	60.3
17/10/2014	10:15:00	60.2	78.3	54.4	56.6	57.7	59.7	61.7	61.5	64.2	61.4
17/10/2014	10:29:00	61.0	79.1	54.4	56.5	57.4	62.8	62.5	62.9	65.2	60.1
17/10/2014	10:45:00	58.3	77.6	53.4	54.0	56.9	59.2	60.3	61.2	60.2	56.9
17/10/2014	10:59:00	58.8	78.0	57.1	56.7	57.7	60.4	61.1	60.2	59.6	56.7
17/10/2014	11:15:00	59.2	78.1	52.2	55.0	58.8	60.7	62.8	64.7	62.5	58.8
17/10/2014	11:30:00	58.6	78.5	54.4	56.1	56.0	61.4	61.2	62.4	61.6	56.6
17/10/2014	11:45:00	58.5	77.0	53.8	53.6	56.9	60.3	63.5	64.9	61.8	58.1
17/10/2014	12:00:00	59.5	77.8	54.4	54.8	56.7	59.7	61.8	64.6	63.3	58.3
17/10/2014	12:15:00	59.6	77.3	55.2	55.3	56.9	59.5	62.5	65.8	66.7	62.7
17/10/2014	12:29:00	58.3	77.0	57.4	57.0	57.3	58.7	60.7	63.6	63.2	58.6
17/10/2014	12:45:00	60.1	77.5	55.4	57.1	58.5	60.8	61.3	62.8	66.5	60.4
17/10/2014	13:00:00	58.9	77.7	57.5	57.1	58.0	62.7	64.4	64.5	62.2	58.5
17/10/2014	13:15:00	59.4	77.4	57.1	56.9	58.1	59.6	62.7	61.9	62.0	59.8
17/10/2014	13:30:00	59.2	78.0	55.7	56.1	57.9	59.6	63.2	63.6	62.0	60.7
17/10/2014	13:44:00	57.6	71.1	53.1	52.8	55.2	58.5	60.3	62.8	61.5	55.7

APPENDIX F: GLOSSARY OF ACOUSTIC TERMS

DECIBEL (dB) - A unit of sound pressure measurement
Sound Pressure Level in dB (*L*p) = 20 log (Measured sound pressure/Reference sound pressure = 20 µPa)

dB(A) - The A -weighted sound pressure level, the weighting network reduces low frequency sound in a similar way to the human ear.

REVERBERATION TIME (RT or *T*) – decay of sound in rooms
The time taken for a sound, once terminated, to fall through 60dB i.e. to one millionth of its original sound intensity. *T*30 – RT for first 30dB of decay. RT_{500} - Mid frequency RT.

HERTZ (Hz) - a unit of frequency measurement. The normal range of hearing is from 20Hz to about 15kHz.

ABSORPTION COEFFICIENT – degree to which a material absorbs sound.
The ratio of absorbed to incident sound energy (perfect absorber = 1)

SOUND REDUCTION INDEX *R* – quantity which describes a material's ability to reduce the sound pressure level across it (e.g. a wall or floor)

$R = L1 - L2 + 10\log (S/A)$

*L*1 - Average sound pressure level in source room (averaged from 100 Hz – 3150 Hz)
*L*2 - Average sound pressure level in receiving room (averaged from 100 Hz – 3150 Hz)
S – Wall Area (m^2)
A – Total absorption in receiving room (m^2 units)

*R*w – weighted sound reduction index

AVERAGE ROOM TO ROOM LEVEL DIFFERENCE – *D*, dB = *L*1 – *L*2, averaged 1/3 octave bands from 100Hz – 3150kHz.

*D*w – weighted value of D (usually 2 - 3dB higher)

*D*nT, w – *D*w corrected for reverberation time of receiving room

NOISE RATING CURVES (NR CURVES) – set of curves used to describe optimum background noise levels for different tasks.

*L*10/90 LEVEL (dB) - The level in dB of a time varying sound pressured level (e.g. traffic) exceeded for 10%/90% of the time of measurement.
*L*90 is usually called the BACKGROUND NOISE LEVEL.

*L*eq AVERAGE SOUND PRESSURE LEVEL – level dB of a time varying sound pressure level with equal amounts of energy above and below it, for the time of measurement.

TONAL NOISE – noise of a single frequency (or a narrow band of frequencies that can be perceived as a tone), audible above the broad band noise background. Noise which is at least 5dB above the average of the 1/3 octave band sound pressure levels immediately on either side of it.