
TVP Atlantic House, Reading

Environmental Noise Assessment Report

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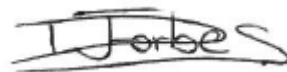
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1 Introduction

BDP Acoustics has been commissioned to provide an Environmental Noise Assessment report for the Atlantic House scheme in Reading.

The proposed scheme will see the existing 3-storey Atlantic House office building refurbished for Thames Valley Police to include the following accommodation.

- Meeting Rooms
- Briefing Rooms
- 1:1 Booths
- Individual Offices
- Viper View Room
- Staff Rooms
- Open Plan Offices
- Atrium Reception Area
- Locker / Changing Rooms
- Storage

This report includes the following:

- Review of current planning guidance and acoustic standards related to the environmental noise assessment of the development, including Local Planning Authority requirements;
- A summary of the environmental noise surveys undertaken;
- Considers suitable internal acoustic design criteria based on current best practice and relevant guidance and standards;
- High level assessment of the existing building envelope performance for the new building development;
- Noise limits for fixed plant installations associated with the proposed development.

A glossary of acoustic terms is presented in Appendix I – Glossary of Acoustic Terms.

2 Relevant Guidance and Standards

2.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. It replaces a number of previous planning policy documents, including Planning Policy Guidance 24: Planning and Noise (PPG 24). Unlike PPG24 which it replaced, NPPF does not contain any methodology for objective assessment. The relevant Local Planning Authority must therefore consider the suitability of any proposed scheme themselves, based on evidence such as this environmental noise assessment report.

2.2 BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

BS 4142:2014+A1:2019 (BS 4142) provides a method for rating industrial and commercial sound and a method for assessing resulting impacts upon people. The impact assessment procedure described in BS 4142 is based on the comparison of rating sound level with the background sound level prevailing at the assessment locations.

2.3 BS 8233: 2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

This code of practice recommends suitable acoustic rating criteria for various indoor environments and uses. BS8233 recommends levels for overall noise design of a building based on existing guidelines issued by the WHO for areas where a controlled acoustic environment is necessary.

2.4 Finishes & Interiors Sector (FIS) – A Guide to Office Acoustics 2015

This guide to office acoustics has been developed by FIS to promote best practice in the design and installation of acoustic solutions in offices.

This guide aims to set out the parameters for noise, reverberation and privacy, in order to heighten awareness and promote best practice in office design.

2.5 British Council for Offices Guide to Specification 2019

The BCO Guide to Specification 2019 gives guidance on the noise levels for offices for residual external noise, after attenuation by the building façade.

2.6 British Council for Offices Guide to Fit Out 2011

The BCO Guide to Fit Out 2011 is supplementary to the BCO Guide to Specification document, giving office design guidance at the fit out stage. The document includes additional combined noise ratings for internal spaces due to building services and external intrusion.

2.7 Health Technical Memorandum 08-01: Acoustics (HTM 08-01)

Health Technical Memorandum 08-01 gives comprehensive advice and guidance on the acoustic design, installation and operation of specialised building and engineering technology used in the delivery of healthcare.

Some of the acoustic design guidance contained within this document is also applicable to commercial office developments, including guidance on appropriate noise limits for emergency plant equipment.

2.8 Local Planning Authority

Advice has been sought from Reading Borough Council in regards to suitable noise level criteria and assessment methodology for noise egress from the proposed development. The following recommendations were provided by Jodie Wilson, the LPA's Senior Environmental Health Officer:

"The assessment shall be carried out in accordance with BS4142:2014 methodology. The predicted specific sound level ($L_{Aeq,Tf}$) as measured at a point 1 metre external to sensitive façades shall be at least 10dB below the existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation. The predicted rating level, $L_{A,Tf}$ (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to sensitive façades shall not exceed the existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation."

3 Proposed Assessment Criteria

3.1 Internal noise level criteria

Suitable internal noise level criteria, commensurate with current best practice and relevant standards and guidance as detailed above, will be incorporated into the scheme design.

3.2 External noise emission criteria

External noise limits for fixed plant items should be set in-line with those of the Local Planning Authority.

The following external noise emission criteria are proposed following engagement between BDP Acoustics and Reading Borough Council's Environmental Health department:

- The cumulative specific noise level ($L_{Aeq,Tr}$) resulting from all fixed plant noise sources associated with the proposed development should not exceed a level 10dB below the measured pre-development background noise level (dB L_{A90}) when assessed in accordance with BS 4142 at the position of the nearest or most exposed noise sensitive receptor(s).
- The cumulative rating noise level (dB $L_{Ar,Tr}$) resulting from all fixed plant noise sources associated with the proposed development should not exceed the measured pre-development background noise level (dB L_{A90}) when assessed in accordance with BS 4142 at the position of the nearest or most exposed noise sensitive receptor(s).

4 Environmental Noise Surveys

4.1 Introduction

Environmental noise surveys were undertaken on Friday 20th – Monday 23rd September 2019 at various positions on and in the vicinity of the project site building to establish the baseline noise climate at the proposed development site, and in the vicinity of nearby noise sensitive receptors.

The data obtained has been used to inform the assessment of the building envelope; and to inform the relevant environmental noise criteria and corresponding noise limits for building services plant associated with the proposed new development.

4.2 Methodology

A series of unmanned long-term and manned short-term measurements were undertaken by BDP Acoustics at a number of locations on and in the vicinity of the Atlantic House site. The approximate measurement positions are presented in Figure 1 and were selected to:

- Provide data representative of the typical worst-case, i.e. noisiest, on-site noise climate externally (positions Ext 1 – 2) in order to inform assessment of the building envelope;
- Provide data representative of the typical worst-case, i.e. quietest, noise climate at the nearest or most exposed noise sensitive receptors during the daytime (positions NSR 1 – 2) and night-time (positions LT 1 – 2) for the purposes of informing environmental plant noise limits.

Unmanned long-term logging measurements at positions LT 1 – 2 were undertaken between 1830 hours on Friday 20th and 1450 hours on Monday 23rd September, providing data for night-time background noise levels (2300 – 0700 hours) at positions equivalent to

the nearest noise sensitive receptor properties in order to inform the project environmental plant noise limits.

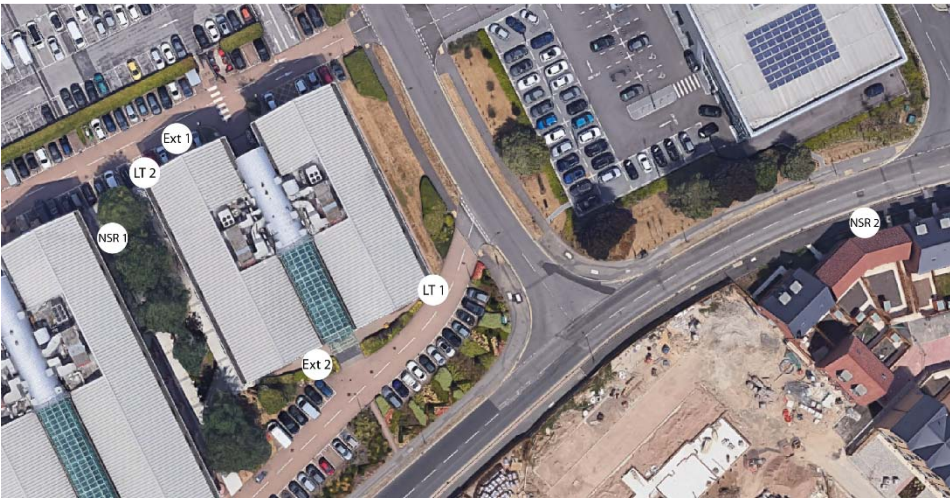
Manned spot measurements at positions NSR 1 – 2 were undertaken between 1100 – 1135 hours on Monday 23rd September to provide data for background noise levels during the worst-case, i.e. quietest, daytime periods at the nearest noise sensitive receptor properties to the proposed development in order to inform the project environmental plant noise limits.

Meteorological conditions during the survey were generally fine and dry with partial cloud cover (ranging 50 – 80%), wind speeds varying below 2 m/s easterly and temperatures varying around 19°C.

Manned measurements were taken using a B&K 2250 sound level meter and unmanned measurements were taken using 2no. Rion NA-28 sound level meters. All meters were field calibrated prior to commencing the survey and upon completion with no significant drift in sensitivity observed. The sound level meters and calibrators used on site had been calibrated to traceable standards and calibration certificates can be provided upon request.

At each measurement position the octave band and A-weighted fast-response levels were recorded for a comprehensive suite of noise level metrics. All manned measurements were taken at a height of 1.5m above local ground level in free-field conditions. Unmanned measurements were taken at an approximate height of 10m above ground level (1.5m above 2nd floor height) at 0.5m from the Atlantic House building façade. Measurements were carried out by Dan Forbes AMIOA.

Figure 1: Approximate external survey measurement positions



4.3 Results

The environmental noise surveys indicated the baseline noise climate on and in the immediate vicinity of the project site during the daytime is dominated by road traffic noise. Additional contributions in noise were observed to result from occasional wind in the trees (only audible externally), movements from passers-by walking and talking and movement of vehicles around the local commercial estate.

A summary of the environmental noise levels measured at the various survey positions can be found in Table 1. Full measured results for the manned short-term measurement positions can be found in Appendix II – Noise Survey Measurement Data. Full measured results for the unmanned long-term measurement positions can be provided upon request.

Table 1: Environmental noise survey results summary

Measurement Position	Start Time (dd/mm/yyyy hh:mm)	L _{Aeq,5mins} Range (dB)	L _{AFmax,5mins} Range (dB)	L _{A90,5mins} Range (dB)
LT 1	20/09/2019 23:00	46 - 63	55 - 80	42 - 54
LT 1	21/09/2019 23:00	43 - 62	54 - 76	38 - 54
LT 1	22/09/2019 23:00	45 - 68	56 - 79	41 - 62
LT 2	20/09/2019 23:00	42 - 54	48 - 83	41 - 47
LT 2	21/09/2019 23:00	45 - 53	49 - 66	44 - 48
LT 2	22/09/2019 23:00	46 - 56	52 - 68	45 - 54
Ext 1	23/09/2019 11:45	50 - 52	62 - 63	48 - 49
Ext 2	23/09/2019 12:10	58 - 60	68	54 - 56
NSR 1	23/09/2019 11:01	51 - 52	60 - 69	48 - 49
NSR 2	23/09/2019 11:20	71 - 73	81 - 92	50 - 54

Note: Ranges for the unmanned long-term measurements cover an 8 hour period from 2300 hours to 0700 hours, whereas ranges for the manned measurements cover 10-15 minute periods.

5 Building Envelope Sound Insulation

Manned spot measurements within the building were carried out during worst-case, i.e. noisiest, daytime periods (0850 – 1100 hours) to obtain typical daytime internal noise levels. The results from these measurements are summarised in Table 2.

Table 2: Summary of sample indoor ambient noise levels

<i>Elevation</i>	<i>Start Time (dd/mm/yyyy hh:mm)</i>	<i>L_{Aeq,5mins} Range (dB)</i>
West	23/09/2019 08:51	30
West	23/09/2019 10:06	29
North	23/09/2019 09:17	27 - 28
North	23/09/2019 10:18	28 - 29
East	23/09/2019 09:31	31 - 34
East	23/09/2019 10:31	32 - 33
South	23/09/2019 09:50	36
South	23/09/2019 10:43	36 - 37

The sample noise level measurements indicate that with the existing building envelope suitable internal noise levels can be achieved in respect to the proposed accommodation.

6 External Noise Emission Limits

Fixed plant and equipment installations must be selected and/or designed to ensure that the noise they generate will not disturb nearby noise sensitive receptors.

Based on the noise levels measured at the nearest or most exposed noise sensitive receptors (NSR), Table 3 presents the recommended external noise limits for fixed plant and equipment installations associated with the new development, in order to comply with the proposed design criteria in Section 3.2 of this report.

Noise limits only apply to noise sensitive premises during periods when the noise sensitive premises is occupied.

It should be noted that the proposed plant noise limit is for the cumulative ratings of all items of plant, and subsequent allowance should be made for the number of noise sources.

Table 3: Proposed nearest or most exposed noise sensitive receptor (NSR) noise limits for fixed plant and equipment installations associated with the new development

Nearest or most exposed noise sensitive receptor (NSR) location	Time Period	Representative measured existing background noise level at NSR (dB L_{A90,5min})	External noise level limits at the NSR façade location for plant items and processes associated with the new development	
			Specific noise level limit (dB L_{Aeq,Tt})	Rating noise level limit (dB L_{A,r,Tt})
Residential properties on Imperial Way	Daytime (07:00 - 23:00 hours)	50	40	50
	Night-time (23:00 - 07:00 hours)	43	33	43
Industrial/commercial property to adjacent west	Daytime (07:00 - 23:00 hours)	48	38	48

7 Summary

BDP Acoustics has been commissioned to provide an Environmental Noise Assessment report for the Atlantic House scheme in Reading.

In summary:

- Suitable project acoustic criteria relating to internal noise levels and external noise emissions resulting from the operation of the proposed development have been considered, based on relevant guidance documents and Local Planning Authority requirements.
- Environmental noise surveys have been carried out to determine the existing noise climate at the site and at the nearest or most exposed noise sensitive receptor locations.
- Using noise survey data gathered on-site, a high level assessment of the building envelope has been undertaken. The assessment indicates that with the existing building envelope, suitable internal noise levels can be achieved in respect to the proposed accommodation.
- Referencing the noise survey data gathered on-site, external noise limits due to fixed plant and equipment installations at nearest or most exposed noise sensitive receptors have been recommended to comply with the proposed external noise emission criteria and Local Planning Authority requirements.

Appendix I – Glossary of Acoustic Terms

A-Weighting

Normal hearing covers the frequency range from approximately 20Hz to 20kHz but sensitivity is greatest between about 500Hz and 8kHz. The "A-Weighting" is an electronic filters network incorporated in sound level meters which approximately corresponds to the frequency response of the ear. The unit of measurement of A-weighted sound level is dBA or dB(A).

Break-in

Noise transmission into a structure from the outside.

Decibel, dB

This is a relative unit of measurement which in acoustics is the unit to measure sound. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). The dB is a logarithmic unit used to describe a ratio between the measured level and a reference or threshold level of 0dB (re. 20 micro-Pascals). We therefore use a logarithmic scale to describe sound pressure level, intensities and sound power levels. Subjectively, an increase of 10dB corresponds to a doubling in the perceived loudness of sound.

Equivalent Continuous Sound Level, L_{eq} or L_{Aeq}

The equivalent continuous sound level, L_{eq} is a notional sound level. It is the sound level, which, if maintained for a given length of time, would produce the same acoustic energy as a fluctuating noise over the same time period. (The formula for the above is implemented electronically in all good sound level meters and it is customary to measure rather than calculate the equivalent continuous sound level.) L_{Aeq} (A-weighted L_{eq}) is widely used to measure any environmental noise which varies considerably with time.

Façade Position

A measurement position located 1m away from a reflecting surface, typically a building façade. At a façade position, the sound level is recognised to be +3dB higher than a measurement taken at the same position without the presence of a reflecting surface.

Free Field

A sound field region with no adjacent reflecting surfaces.

Octave and Third Octave Bands

The human ear is sensitive to sound over a range of approximately 20Hz to 20kHz, and is generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum is divided into frequency bands (continuous range of frequencies between two limiting frequencies), and the sound pressure level is measured in each band. The most commonly used frequency bands are octave bands, in which the mid-frequency of each band is twice that of the band below it. (For instance the octave bands above and below the 500Hz octave band are 1kHz and 250Hz respectively). For finer analysis, each octave band may be split into three one-third octave bands or in some cases, fine frequency bands.

Rating Level, $L_{Ar,Tr}$

The specific sound level plus any adjustment for the characteristic features of the sound, as described in BS 4142:2014.

Specific Sound Level, L_s or $L_{Aeq,Tr}$

The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

Statistical Level: L_{90} or L_{A90}

Sound pressure level that is exceeded for 90% of the measurement time. Consequently it is indicative of the general background noise level in the absence of any higher level short duration events that occur during the period.

Statistical Level: $L_{max,T}$

A noise level index defined as the maximum RMS sound pressure level measured during the measurement period, T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

Time Weighting

One of the standard averaging times (Fast (F), Slow (S)) used for the measurement of RMS sound pressure level in sound level meters, specified in BS 5969.

Z-Weighting

Z-weighting or "zero weighting" is where no frequency weighting has been applied to the measured values.

Appendix II – Noise Survey Measurement Data

Full noise survey measurement data for manned measurement positions

Measurement Position	Start Time (dd/mm/yyyy hh:mm)	Duration (mm:ss)	Metric	$L_{Aeq,5min}$ (dB) / $L_{AFmax,5min}$ (dB) / $L_{A90,5min}$ (dB)	$L_{Zeq,5min}$ and $L_{Zmax,5min}$ and $L_{Z90,5min}$ (dB) at octave band centre frequency							
					63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ext BI 1	23/09/2019 11:45	05:00	Leq	51.1	58.5	51.7	48.6	47.8	47.9	41.8	35.6	26.8
Ext BI 1	23/09/2019 11:52	05:00	Leq	50.4	60.3	53.4	49.3	46.9	46.9	40.9	35.1	33.0
Ext BI 1	23/09/2019 11:58	05:00	Leq	51.6	59.8	55.1	50.0	48.2	47.8	42.4	35.8	29.1
Ext BI 2	23/09/2019 12:10	05:00	Leq	58.4	67.3	60.0	55.1	54.4	55.4	49.7	41.9	32.8
Ext BI 2	23/09/2019 12:16	05:00	Leq	58.6	67.8	58.0	54.0	54.8	55.7	49.9	42.5	34.5
Ext BI 2	23/09/2019 12:22	05:00	Leq	59.7	69.4	60.2	55.4	55.6	56.5	51.3	44.6	36.1
Int 1	23/09/2019 08:51	05:00	Leq	29.9	37.9	31.0	30.8	25.5	24.3	22.3	19.2	17.0
Int 1	23/09/2019 08:56	05:00	Leq	29.8	36.8	31.5	30.5	25.5	24.9	22.0	16.9	15.0
Int 1	23/09/2019 10:06	05:00	Leq	28.5	34.3	29.4	29.2	24.1	23.5	21.0	16.1	14.9
Int 1	23/09/2019 10:11	05:00	Leq	28.7	34.6	28.5	29.0	25.7	23.5	20.0	17.2	15.3
Int 2	23/09/2019 09:17	05:00	Leq	27.0	44.8	30.5	29.5	21.0	22.4	16.4	13.2	13.7
Int 2	23/09/2019 09:22	05:00	Leq	27.7	44.1	32.1	30.5	21.4	23.2	17.4	13.7	13.3
Int 2	23/09/2019 10:18	05:00	Leq	29.2	44.0	30.6	29.1	24.9	25.0	20.1	16.3	15.0
Int 2	23/09/2019 10:23	05:00	Leq	28.3	45.1	30.3	29.2	22.9	23.8	19.6	15.9	14.0
Int 3	23/09/2019 09:31	05:00	Leq	33.7	46.3	36.9	35.0	27.7	29.8	24.8	20.1	15.7
Int 3	23/09/2019 09:36	05:00	Leq	31.0	41.5	31.6	31.9	26.0	27.5	21.7	15.4	14.1
Int 3	23/09/2019 10:31	05:00	Leq	32.0	43.0	32.4	31.8	26.2	28.5	23.3	19.0	15.8
Int 3	23/09/2019 10:36	05:00	Leq	32.5	43.0	36.3	35.7	26.5	28.4	22.5	16.7	14.3
Int 4	23/09/2019 09:50	05:00	Leq	36.3	49.1	36.1	35.3	29.4	33.6	27.3	22.0	19.0
Int 4	23/09/2019 09:55	05:00	Leq	35.7	48.2	34.5	34.7	28.7	33.6	25.9	15.4	13.5
Int 4	23/09/2019 10:43	05:00	Leq	37.2	46.8	39.1	37.2	31.4	34.8	27.2	17.9	14.5
Int 4	23/09/2019 10:48	05:00	Leq	35.9	49.6	39.0	35.0	29.0	33.4	26.0	19.1	15.7
NSR 1	23/09/2019 11:01	05:00	Leq	52.2	60.0	50.4	45.2	47.6	48.3	45.4	41.0	32.0
NSR 1	23/09/2019 11:06	05:00	Leq	51.4	61.0	51.3	45.8	47.3	47.9	43.4	38.8	33.0
NSR 1	23/09/2019 11:11	05:00	Leq	51.7	62.8	53.8	47.3	48.0	48.3	43.3	36.7	31.1
NSR 2	23/09/2019 11:20	05:00	Leq	70.5	71.3	65.3	66.1	65.6	68.4	61.1	53.6	45.8
NSR 2	23/09/2019 11:25	05:00	Leq	70.9	71.5	66.9	66.7	65.6	68.8	61.7	52.8	44.9
NSR 2	23/09/2019 11:30	05:00	Leq	72.9	75.1	70.0	69.6	69.2	70.1	63.8	57.4	51.0

Ext BI 1	23/09/2019 11:45	05:00	Lmax	62.3	69.3	61.7	61.1	55.5	56.1	59.2	54.9	42.0
Ext BI 1	23/09/2019 11:52	05:00	Lmax	61.5	72.7	68.3	67.0	58.1	55.6	53.9	53.3	56.0
Ext BI 1	23/09/2019 11:58	05:00	Lmax	62.7	72.4	72.3	63.2	62.5	59.1	55.5	52.2	50.0
Ext BI 2	23/09/2019 12:10	05:00	Lmax	68.1	76.2	78.0	67.2	64.2	65.8	61.0	56.5	52.5
Ext BI 2	23/09/2019 12:16	05:00	Lmax	67.5	83.1	70.4	64.1	66.4	63.9	58.0	52.8	52.1
Ext BI 2	23/09/2019 12:22	05:00	Lmax	68.4	81.0	71.6	69.1	65.1	66.2	61.2	58.1	47.9
Int 1	23/09/2019 08:51	05:00	Lmax	51.6	49.3	45.8	45.0	39.9	41.9	46.7	46.6	41.5
Int 1	23/09/2019 08:56	05:00	Lmax	50.4	46.8	41.6	42.9	45.1	47.0	45.9	39.7	34.5
Int 1	23/09/2019 10:06	05:00	Lmax	49.9	42.7	51.6	45.9	45.2	45.8	45.6	35.2	28.1
Int 1	23/09/2019 10:11	05:00	Lmax	49.3	43.5	43.7	50.1	48.1	45.1	40.6	43.9	39.0
Int 2	23/09/2019 09:17	05:00	Lmax	38.8	58.8	38.6	38.2	39.3	32.5	29.3	27.8	30.5
Int 2	23/09/2019 09:22	05:00	Lmax	45.2	54.2	45.6	42.7	39.8	39.8	40.4	38.2	31.9
Int 2	23/09/2019 10:18	05:00	Lmax	46.5	56.3	46.7	43.8	47.4	41.1	37.8	43.2	39.4
Int 2	23/09/2019 10:23	05:00	Lmax	43.2	60.7	43.4	39.7	41.4	38.1	36.5	34.6	27.3
Int 3	23/09/2019 09:31	05:00	Lmax	51.5	63.8	57.9	51.2	38.7	44.7	48.2	46.0	37.5
Int 3	23/09/2019 09:36	05:00	Lmax	41.5	62.2	42.9	42.9	40.3	35.9	38.0	29.5	26.7
Int 3	23/09/2019 10:31	05:00	Lmax	51.8	58.8	54.4	52.3	48.0	47.8	46.8	42.2	40.2
Int 3	23/09/2019 10:36	05:00	Lmax	51.9	56.4	49.6	49.0	43.8	47.8	47.1	40.9	33.0
Int 4	23/09/2019 09:50	05:00	Lmax	57.0	60.3	51.5	51.1	47.5	50.4	51.5	49.7	48.4
Int 4	23/09/2019 09:55	05:00	Lmax	46.6	60.4	44.5	45.0	39.6	46.1	34.6	33.6	31.5
Int 4	23/09/2019 10:43	05:00	Lmax	55.0	59.8	56.5	55.6	54.7	51.0	40.5	38.2	32.7
Int 4	23/09/2019 10:48	05:00	Lmax	46.0	70.7	55.5	47.9	42.1	45.0	38.4	38.7	34.1
NSR 1	23/09/2019 11:01	05:00	Lmax	68.7	70.1	63.1	58.0	61.0	62.7	64.0	61.2	52.0
NSR 1	23/09/2019 11:06	05:00	Lmax	61.9	69.2	61.4	57.7	57.5	55.3	54.0	59.0	45.8
NSR 1	23/09/2019 11:11	05:00	Lmax	60.1	75.6	68.7	58.0	60.5	55.3	54.0	47.9	44.3
NSR 2	23/09/2019 11:20	05:00	Lmax	84.2	88.2	81.7	78.5	78.9	81.7	78.7	79.0	70.4
NSR 2	23/09/2019 11:25	05:00	Lmax	81.0	87.8	83.8	79.9	79.1	78.7	73.6	68.8	63.1
NSR 2	23/09/2019 11:30	05:00	Lmax	92.4	94.1	90.4	89.4	89.7	87.3	85.2	81.8	74.5

Ext BI 1	23/09/2019 11:45	05:00	L90	49.3	55.8	46.9	44.5	45.5	46.3	39.3	32.3	21.8
Ext BI 1	23/09/2019 11:52	05:00	L90	48.5	56.4	48.1	44.3	44.3	44.6	37.8	30.9	19.2
Ext BI 1	23/09/2019 11:58	05:00	L90	47.7	56.5	46.9	43.2	43.8	44.3	38.1	31.2	19.8
Ext BI 2	23/09/2019 12:10	05:00	L90	54.7	63.8	54.0	49.3	50.7	51.5	45.0	35.9	25.4
Ext BI 2	23/09/2019 12:16	05:00	L90	54.1	63.2	52.5	48.0	50.4	51.3	44.8	35.7	26.8
Ext BI 2	23/09/2019 12:22	05:00	L90	55.9	65.1	56.0	51.0	52.1	52.6	47.0	38.8	28.9
Int 1	23/09/2019 08:51	05:00	L90	26.5	33.1	27.9	27.1	21.8	21.1	17.6	11.2	12.2
Int 1	23/09/2019 08:56	05:00	L90	25.8	32.9	27.7	27.2	20.5	19.8	16.5	11.5	12.3
Int 1	23/09/2019 10:06	05:00	L90	24.0	31.0	25.1	25.0	19.4	17.8	14.6	11.2	12.2
Int 1	23/09/2019 10:11	05:00	L90	24.1	31.2	25.3	25.1	20.1	17.9	14.1	11.2	12.2
Int 2	23/09/2019 09:17	05:00	L90	25.0	40.8	28.4	27.1	18.0	19.8	13.1	10.6	12.1
Int 2	23/09/2019 09:22	05:00	L90	25.0	40.5	28.8	27.3	18.1	19.8	12.5	10.6	12.1
Int 2	23/09/2019 10:18	05:00	L90	25.7	39.6	27.6	26.3	19.5	21.0	15.1	11.3	12.2
Int 2	23/09/2019 10:23	05:00	L90	24.8	39.4	27.3	25.7	18.2	20.1	13.6	11.2	12.2
Int 3	23/09/2019 09:31	05:00	L90	26.2	34.4	26.7	25.5	20.1	21.4	15.9	11.7	12.2
Int 3	23/09/2019 09:36	05:00	L90	24.2	33.0	26.0	24.1	18.5	19.5	14.3	11.3	12.2
Int 3	23/09/2019 10:31	05:00	L90	25.3	34.6	26.0	24.7	19.2	21.4	15.0	11.4	12.2
Int 3	23/09/2019 10:36	05:00	L90	25.0	33.4	25.7	25.2	18.5	19.8	14.0	11.3	12.2
Int 4	23/09/2019 09:50	05:00	L90	31.1	43.0	31.4	31.2	24.7	27.2	20.6	12.4	12.2
Int 4	23/09/2019 09:55	05:00	L90	30.3	42.4	30.5	30.2	23.9	27.0	19.9	12.0	12.1
Int 4	23/09/2019 10:43	05:00	L90	32.0	40.6	31.2	31.0	25.1	29.2	21.8	12.4	12.2
Int 4	23/09/2019 10:48	05:00	L90	31.4	41.2	31.5	31.0	24.7	28.3	21.1	12.6	12.3
NSR 1	23/09/2019 11:01	05:00	L90	48.5	57.4	47.5	42.5	45.1	45.0	38.8	31.9	24.1
NSR 1	23/09/2019 11:06	05:00	L90	49.4	58.1	48.2	42.8	45.1	45.6	40.4	33.1	24.2
NSR 1	23/09/2019 11:11	05:00	L90	49.1	58.2	48.1	43.1	45.2	45.4	39.7	32.7	25.8
NSR 2	23/09/2019 11:20	05:00	L90	49.6	56.4	50.1	45.6	44.4	46.9	40.9	31.4	22.0
NSR 2	23/09/2019 11:25	05:00	L90	51.9	58.6	54.7	49.2	46.7	48.4	43.7	36.5	27.3
NSR 2	23/09/2019 11:30	05:00	L90	54.2	59.2	52.9	50.0	48.5	50.7	46.8	38.4	29.1