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Client: Havant Hockey Club
New Road
Havant
Hampshire
PO9 1QL

Site: Havant College
New Road
Havant
PO9 1QL

Assessment Date: 22nd – 23rd March 2025

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Project: Assessing internal noise break out from future operations within the proposed hockey clubhouse – with the window open

Written by: Mr. Michael D Vine ~ BSc Hons, Member of the Institute of Acoustics (MIOA)

The purpose of this document is to establish the proposed internal noise break-out level for future operations in the 1st floor clubhouse of the proposed hockey clubhouse, with the 1st floor window open as requested by the local authority. In addition, this document will suggest the balcony can be used until 2200hrs rather than 1900hrs suggested by the local authority.

The proposed clubhouse will be erected at 1st floor level (new extension to existing building) above the current changing rooms in a small, detached building located circa 35m to the East of the existing dwellings located on Nicholson Way, Havant. The building comprises of the current changing rooms and is single storey, located in the current college grounds, immediately to the West of the Hockey pitch which is already in place.

A planning application has been made to erect another storey above the changing rooms to create a two-storey building with the ground floor comprising of the changing rooms and shower block etc. and the 1st floor comprising of the bar and clubhouse area. The typical operating hours of the clubhouse will be between 1800-2200hrs during the week and 0900-2330hrs during the weekend.



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The 1st floor will be used as a bar area and clubhouse, with match teas etc. It will not be used as a music venue etc. so the levels internally will be more aligned with a day time venue and not a music venue. No internal levels have been taken due to the building not being built yet, so historic data will be used for such calculations – the detailed calculations below use a source value of 92dBA which will be far higher than the actual measured levels inside the clubhouse.

Furthermore, the main area of the 1st floor will face away from the dwellings and will be screened by the internal staircase and bar storage area so this will reduce the noise break out even more. There is also a balcony that will be erected on the Eastern aspect of the building facing the hockey pitch for spectators to use, again this will be screened completely from the dwellings by the building fabric.

The hockey pitch is already in situ and in use on a regular basis and therefore there is not a new noise source that has been introduced to the area. There is also a high number of vehicle movements that are associated with the college and sports pitches, so these also contribute to acoustic activity. The background noise levels apparent at the site are also included in this report to indicate the current noise spectrum apparent at the site boundary.

Due to the clubhouse being closed currently, historical data can be used as part of this assessment. The following data has been used as part of this assessment.

Site	Criteria	63	125	250	500	1000	2000	4000	8000	L _{Aeq}
Historic data – used for a similar assessment – Live/amplified music	L _{Aeq}	90	87	88	92	89	86	82	80	92

The data above was taken by a local authority in a venue with live music in operation so these levels will be much higher than those anticipated in the clubhouse as they will not have live or amplified music in operation.

The function room has an area of 106m² and a room volume of 255m³. There is one segment (facade) that has been used to determine the noise break out levels, these are shown below. The other 3 facades of the function room face other internal areas of the building or completely away from the dwellings so the noise break out through these facades will be negligible. The assumed noise associated with people using the balcony will be assessed later in the report using a bespoke calculation for people using outside areas.

The table on the following page indicates the building elements that are apparent on the North Façade of the clubhouse, it comprises of a single, laminated window and a timber frame/SIP façade detail, with external cladding & a plasterboard internal lining. The internal elements can be upgraded is required but the façade detail should offer sufficient levels of sound attenuation, coupled with the buffer zone of the stairs, store area and toilet offering a natural acoustic break for the noise within the clubhouse area.

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		SRI								
Façade	Elements	Area	63	125	250	500	1000	2000	4000	8000
Northern Element										
	Laminated glazed window – open	2.15m ²	26	21	27	20	19	23	27	29
	Timber Frame & SIP construction	21.25m ²	37	41	45	45	54	58	58	60

The sound levels for the open window have been taken from NANR116: 'OPEN/CLOSED WINDOW RESEARCH' SOUND INSULATION THROUGH VENTILATED DOMESTIC WINDOWS document, submitted by The Building Performance Centre School of the Built Environment Napier University 10 Colinton Road Edinburgh EH10 5DT. The window data used for the attended visit data was Window C-3

C-3 Window C, laminate glass, bottom hung inward tilt



Opening C-3 25.5 20.9 26.5 20.4 18.5 22.5 27.0 21 (0; -1)

The above sound reduction values have also been taken from the document shown above.

The above values have been used to determine the noise break out of the music through the 1 x façade facing the dwellings (not directly). These are then propagated from the façade to the residential dwelling using the following equation:

$$L_p = L_w - 20 \log r - 11$$

The distance between the buildings was 35m.

To establish the sound reduction offered by the façade elements, the calculations used are shown below. This is in accordance with BS12354-4: 2000 section 4.3 for each segment of the building using. This calculation assesses the Segment substitute point source sound power levels for each segment. The L_w values are then converted into the sound pressure levels at the façade, and these are combined to get a total rating level.

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The facade breakout calculations are shown below. BS12354:4 calculations for proposed function room:

Leq Values shown above.

Facade 1 North Façade			Segment 1								
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Internal noise level Lp			dB	90	87	88	92	86	81	77	74
Diffusivity term Cd (BS 12354-4 Annex B)			dB	0	0	0	0	0	0	0	0
Sound reduction index R dB											
Building element			Area (S) m2	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Window 1			2.15	26	21	27	20	19	23	27	29
Window 2			0	19	20	24	31	35	29	36	34
Window 3			0	19	20	24	31	35	29	36	34
Window 4				0	14	19	25	29	33	25	25
Fire escape door				14	17	21	26	29	31	34	34
Wall			21.25	37	41	45	45	54	58	58	60
Lobbied Entrance				14	17	21	26	29	31	34	34
Segment area (So)			23.4								
Total R' ΣS/So(10^-R/10)				0.000412	0.000802	0.000212	0.0009475	0.0011603	0.0004619	0.0001848	0.0001166
Small openings in facade <1m2				63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
			Dne dB								
			Dne dB								
			Dne dB								
Total Dne' Σ10/So(10^-Dne/10)				1.28E-100	1.28E-100	1.28E-100	1.28E-100	1.28E-100	1.28E-100	1.28E-100	1.28E-100
R'+Dne'				0.000412	0.000802	0.000212	0.0009475	0.0011603	0.0004619	0.0001848	0.0001166
Segment sound reduction index dB				33.851168	30.95844	36.735768	30.234113	29.354221	33.354221	37.333811	39.333811
10log segment area				13.692159	13.692159	13.692159	13.692159	13.692159	13.692159	13.692159	13.692159
Directivity Dc (BS 1235-4 Annex D) dB				0							
Segment sound power level Lw dB				69.84	69.73	64.96	75.46	70.34	61.34	53.36	48.36

The purpose of the above table is to establish the sound power values (Lw) at the clubhouse façade; these figures are then propagated and converted into the sound pressure levels at the residential building façade 35m from the clubhouse.

From the above tables, the following can be determined at the residential facade.

Internal	90	87	88	92	86	81	77	74	93dBA
Lw	70	70	65	75	70	61	53	48	
Agr	0	0	0	0	0	0	0	0	
Lp	28	28	23	33	28	19	11	6	
reflection	3	3	3	3	3	3	3	3	
Lp at façade	31	31	26	36	31	22	14	9	35dBA
Lp (dBA)	35								
LA90 - BGN	36	2300-0000hrs							
Difference	-1	No Adverse Impact							
LA90 - BGN	27dBA	Lowest 3min value during the night time (clubhouse closed)							

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The table above shows that the calculated L_{Aeq} value is 35dBA at the residential façade with the window open. The lowest measured $L_{A90\ 3\text{minute}}$ between the hours of 2300-0000hrs was measured at 36dBA and therefore the calculated levels are below this value, illustrating that the calculated levels will not lead to an adverse impact at the residential façade based on an internal value of 92dBA. It is very unlikely that the internal value will be anywhere near this value so the impact will be even less.

The client has also indicated that the window will be closed during any music events, this will be implemented by the venue.

The background noise was measured at the site boundary over a 24hour period between Saturday 22nd & Sunday 23rd March 2025. The site was operating as usual with hockey practice & matches in operation and the main college also had activity apparent.

The microphone was calibrated before and after the assessment and no drift was recorded.

Equipment used:

Norsonic Environmental Analyser 140 BS EN IEC 61672-1 2013 Class 1 – Associated frequency analyser to BS EN IEC 61260: 1996 Class 1 – serial 1407126 – calibration due March 2026

Measurement Microphone (Nor 1225) – Serial Number 305215 – calibration due March 2026

Acoustic Calibrator - (Type 1251) – Serial No 31652, Calibration due October 2025

People using the balcony area:



The LPA has indicated that the balcony is not used after 1900hrs, however the club wishes this to be used until 2200hrs. 'This is when all hockey activities stop currently, as the club already has noise outside at this time with up to 60 people on a pitch training or playing, and to support evening league games – where again this is current activity with significantly more players and supporters on the sidelines who would clearly make more noise than the number of people on a pitch facing balcony. So, in essence we would like what we already have, which happens without any complaints. The above has been taken directly from the client regarding this point.

Using a simple sound reduction equation for distance would lead to the noise levels at the balcony to reduce by up to -34dB using a source distance of 1m and a receptor distance of 51m, which is the approximate distance between the balcony and dwelling. So, using a source level of 75dBA at 1m, this would equate to a value at the receptor of 41dB, then the screening offered by the building fabric would also have to be considered. This completely screens the balcony from the dwellings so a further reduction of -10dB can be applied to this value, leading to a level of 31dBA at the façade (not to mention other barriers apparent). The LA90 values during the evening time period are:

6pm - 7pm	7pm - 8pm	8pm-9pm	9pm-10pm
43	44.3	39.1	40.5
42.1	43.5	41.9	40.2
41.9	44	40.7	38.7
42.7	41.5	41.5	39
44.1	43.8	41.6	40.1
42.5	43.2	41.8	40.3
43.6	43.1	41.2	40.7
44.2	43.6	40.6	43.1
47.5	41.5	41.4	42.7
46.2	43.5	42	41.8
45.2	41.2	39.9	40.2
45.2	41.7	42.2	42.8
44.3	41.8	39.1	42.6
46.1	41.1	41.6	40.8
44.9	43.3	40	43.6
43.5	40.8	41.3	41.2
46.1	42.5	39.4	40.8
45.2	41.5	39	41.4
46.2	42.6	41.2	40.7
45.7	41.3	41	42.7

45

43

41

41

It can be seen that the measured LA90 1hour value between 2100-2200hrs is 41dBA. The calculated level at the building façade is 30dB so this is -11dB below the LA90 value and with this in mind, and the screening offered by the building, the fact that there will not be any music apparent on the balcony should all indicate that this will not lead to an adverse impact and a cut off time of 2200hrs should be acceptable.

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Determining the noise levels created by such areas is hard to establish, it is understood the garden was in use during the measurement period, but it is accepted that these numbers may increase during the summer months (an event was in operation during the measurement period). The following calculation has been used on this occasion to try and determine the rating level at the façade based on the garden being busy.

The following document has been used to determine the noise created by small groups of people:

'Prediction of noise from small to medium sized groups'

M.J Hayne, J.C Taylor, R.H Rumbe & D.J Mee – 2-4th November 2011, Gold Coast Australia

This document uses the following equation to determine noise levels from small to medium sized groups:

$$L_{Aeq} = 21 \log N + 43 \text{dB(A)}$$

N = number of people

Due to the size of the balcony area, a figure of 30 people using the balcony at any one time would seem fair, so this is the figure used for this calculation:

$$L_{Aeq} = 21 \log 30 + 43 \text{dB(A)} = 74 \text{dBA at source}$$

Based on the equation above, the noise created by 30 people using the garden area would create a noise level of 74dBA. This level can then be calculated at distance using the following equation:

$$L_2 = 20 \log (r_2/r_1)$$

Therefore:

$$74 - 20 \log (51/1) = 40 \text{dBA}$$

The above equation has been used to try and determine the level of the balcony area on the existing dwellings and substantiate the measured levels, it is appreciated that elements such as shouting and raised voices may also increase the rating level, however the calculated value of **40dBA** is assumed for a distance of 51m. This level is in line with the calculated levels above. Please note it is impossible to determine the number of people within the Garden area at any one time, however, a figure of 30 people would seem a worst-case scenario for the balcony.

If the screening for the building is applied, a further -10dB can be applied leading to a value of 30dBA at the receptor, which is significantly below the measured LA90 values at the same time.

Target Values for any Plant:



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The plans indicate that the plant for the building will be located internally so it is unlikely that it will lead to an adverse impact, but the following values are the target values for any plant that is to be installed as part of this application.

	Day Time 0700-2300	Night time 2300-0700	Target Value – Day Time	Target Value – Night Time
LAeq	44dBA 1hour	30dBA 3min	N/A	N/A
LA90	40dBA 1hour	27dBA 3min	<40dBA	<27dBA

The above table shows the lowest measured LA90 1hour & 3minute values as it is not clear if the plant will only be in operation during the opening times of the clubhouse or if it will be in operation during the night time period too.

There are many factors that will contribute to the final rating level of the plant, these include:

1. Distance to receptor – noise will decay over distance
2. Screening offered by building elements
3. Reflection
4. Intermittency
5. Tonality
6. Impulsivity

All the factors above will have an impact on the final rating levels of the plant and some of these will increase the SPL of the system, so this will all have to be calculated if required.

Although, as stated the plant will be located internally so the building will offer a huge amount of sound reduction and that combined with the opening hours of the clubhouse should mean that the plant is negligible at the residential façade.

Results Conclusion:

The conclusions of this report and included calculations indicate that the proposed clubhouse at 1st floor level will not lead to an adverse impact on the existing residential dwellings located 35m to the West of the building even with the window open, but the client will keep this window closed during any music event.

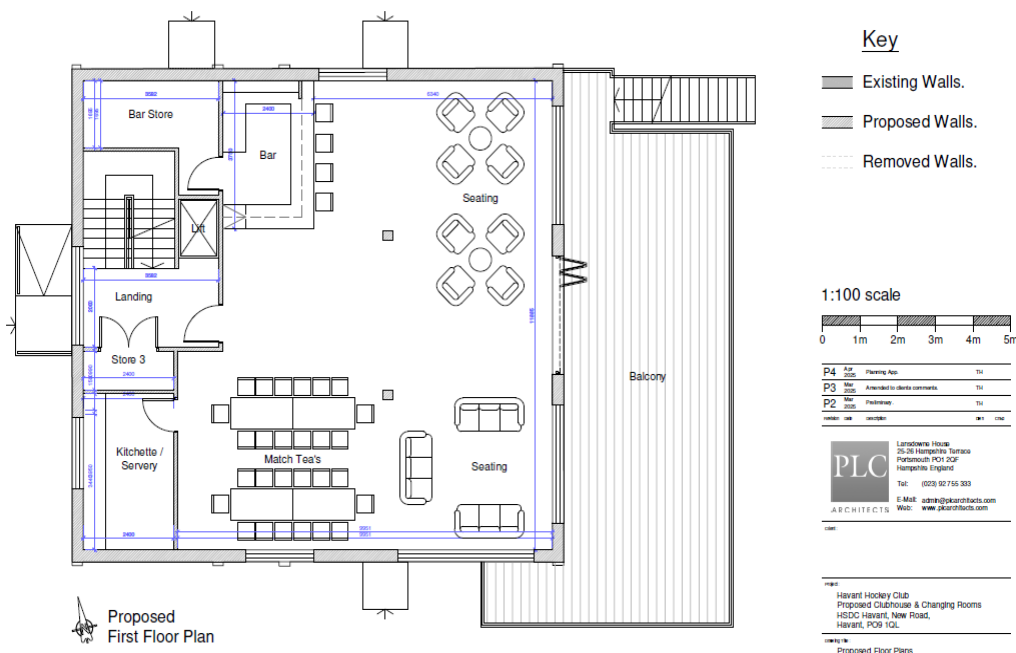
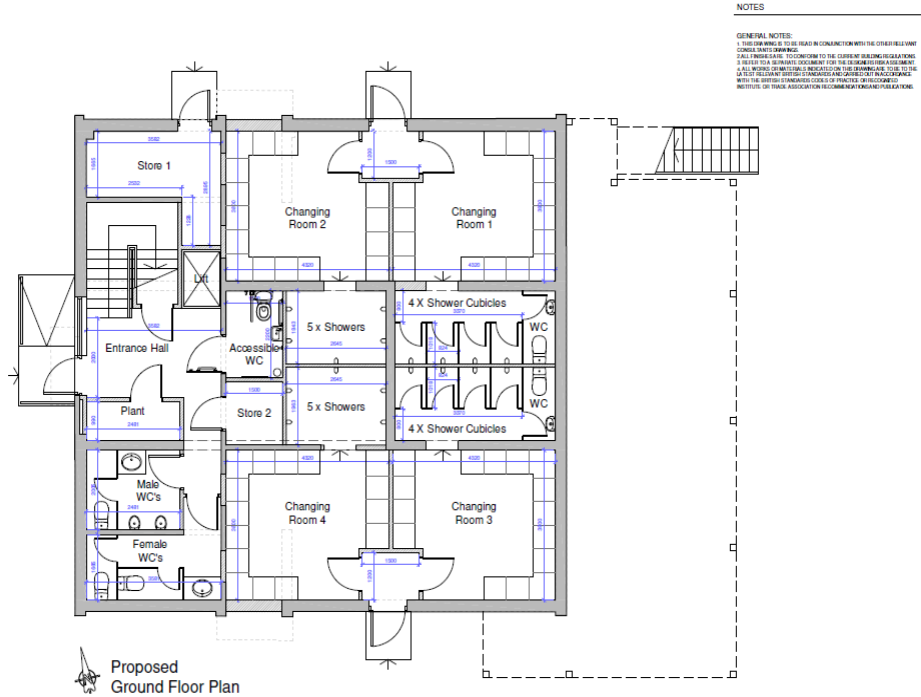
The clubhouse will be used for match day teas, a small bar, and spectators. It will not include live or amplified music. Furthermore, the site is already used for a lot of activities as the college is busy 7 days a week. The car park is also remarkably busy, and the introduction of the clubhouse should not lead to a significant increase in vehicle movement.

The hockey pitch is already in situ and again, has regular use throughout the week and weekend and due to all these points, the introduction of the clubhouse will not lead to an increase in acoustic criteria at the site boundary. The client will also take steps to reduce the impact of the clubhouse at the residential façade, these steps include using traditional building measures for the construction of the clubhouse which have good levels of sound attenuation, screening of the balcony from the dwellings and ensuring the clubhouse is not open during the night time period. All these measures, combined with the activity already associated with the site, indicate that the introduction of the clubhouse to the 1st floor of the current changing rooms will not lead to an adverse impact on the existing residential dwellings.

Site Plan:



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Google Earth Image:



Time Period	L _{Aeq}	L _{Amax}	L _{A90}
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(2025/03/22 12:24:02.00)	51.6	70.1	47.4
(2025/03/22 12:27:02.00)	56.1	72.6	47.7
(2025/03/22 12:30:02.00)	54.1	66.1	48.8
(2025/03/22 12:33:02.00)	54.6	74.7	48.7
(2025/03/22 12:36:02.00)	54.5	73.2	49.1
(2025/03/22 12:39:02.00)	53.1	69.7	47.9
(2025/03/22 12:42:02.00)	51.8	70.3	48
(2025/03/22 12:45:02.00)	52.8	71.8	47.6
(2025/03/22 12:48:02.00)	52.4	70.4	48.5
(2025/03/22 12:51:02.00)	54.1	69	48.4
(2025/03/22 12:54:03.00)	54.1	70	48.4
(2025/03/22 12:57:02.00)	52.6	67	48.1
(2025/03/22 13:00:03.00)	51.6	66.2	48.3
(2025/03/22 13:03:02.00)	53.9	68.3	50.1
(2025/03/22 13:06:02.00)	52.4	68	48.4
(2025/03/22 13:09:02.00)	54	66.1	48
(2025/03/22 13:12:02.00)	56.8	67.2	48.6
(2025/03/22 13:15:02.00)	55.4	65	50.2
(2025/03/22 13:18:02.00)	55.9	68.6	49.9
(2025/03/22 13:21:02.00)	53.8	73.7	47.4
(2025/03/22 13:24:02.00)	51.2	60.7	47.5
(2025/03/22 13:27:02.00)	50.9	59	47
(2025/03/22 13:30:02.00)	51.6	72.5	47.7
(2025/03/22 13:33:02.00)	50.9	68.9	47.3
(2025/03/22 13:36:02.00)	54.7	71.3	49.3
(2025/03/22 13:39:02.00)	52.9	67.1	48.3
(2025/03/22 13:42:02.00)	53.1	68.4	45.5
(2025/03/22 13:45:02.00)	59.2	77.6	49
(2025/03/22 13:48:02.00)	53.5	74.9	47.8
(2025/03/22 13:51:02.00)	55.1	74.1	48.9
(2025/03/22 13:54:02.00)	51.9	74.8	47.3
(2025/03/22 13:57:02.00)	51.5	70.3	47.5
(2025/03/22 14:00:02.00)	53.2	68.3	49.4
(2025/03/22 14:03:02.00)	52.8	71.8	48.5
(2025/03/22 14:06:02.00)	51.6	63.4	49.1
(2025/03/22 14:09:02.00)	52	62.5	48.5
(2025/03/22 14:12:02.00)	52.3	63.5	49.8
(2025/03/22 14:15:02.00)	52.9	60.6	48.4
(2025/03/22 14:18:02.00)	51.9	59.2	48.8
(2025/03/22 14:21:02.00)	51.2	58	47.9
(2025/03/22 14:24:02.00)	50.4	56	47.6
(2025/03/22 14:27:02.00)	51	65	48.5
(2025/03/22 14:30:02.00)	51.2	67.7	48.3
(2025/03/22 14:33:02.00)	55.2	76.7	49
(2025/03/22 14:36:02.00)	58.3	76.4	50.6
(2025/03/22 14:39:02.00)	52.5	73.6	49.3
(2025/03/22 14:42:02.00)	51.8	65.7	49.3
(2025/03/22 14:45:02.00)	50.6	68.8	46.1

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(2025/03/22 14:48:02.00)	50.9	59.8	48.7
(2025/03/22 14:51:02.00)	52.1	71.5	48.4
(2025/03/22 14:54:02.00)	51.3	66.8	47.8
(2025/03/22 14:57:02.00)	50	62.1	47.3
(2025/03/22 15:00:02.00)	58.2	76.4	50
(2025/03/22 15:03:02.00)	54.1	69.5	49.7
(2025/03/22 15:06:02.00)	59	79.5	48.1
(2025/03/22 15:09:02.00)	51.6	73.3	47.7
(2025/03/22 15:12:02.00)	53.7	69.8	48.8
(2025/03/22 15:15:02.00)	50.8	66.5	46.8
(2025/03/22 15:18:02.00)	54	69.1	48.8
(2025/03/22 15:21:02.00)	51.4	65.9	48.7
(2025/03/22 15:24:02.00)	50.3	65.4	47
(2025/03/22 15:27:02.00)	50.3	69.2	47.1
(2025/03/22 15:30:02.00)	50.1	63	47.6
(2025/03/22 15:33:02.00)	51.9	70.1	46.5
(2025/03/22 15:36:02.00)	52	70.2	47.5
(2025/03/22 15:39:02.00)	50.8	66.6	47
(2025/03/22 15:42:02.00)	49.2	60.1	46.6
(2025/03/22 15:45:02.00)	52.1	69	46.8
(2025/03/22 15:48:02.00)	53.1	72.2	46.8
(2025/03/22 15:51:02.00)	51.9	66.2	46.6
(2025/03/22 15:54:02.00)	54.7	69.4	46.8
(2025/03/22 15:57:02.00)	51.6	63.1	47
(2025/03/22 16:00:02.00)	50.2	63.2	45.7
(2025/03/22 16:03:02.00)	49.2	60.7	45.7
(2025/03/22 16:06:02.00)	53.6	70.6	46.2
(2025/03/22 16:09:02.00)	52.1	68.1	44.8
(2025/03/22 16:12:02.00)	50.5	66	45.3
(2025/03/22 16:15:02.00)	51	66.6	46.2
(2025/03/22 16:18:02.00)	52.1	64.6	46.6
(2025/03/22 16:21:02.00)	50.4	66.6	44.4
(2025/03/22 16:24:02.00)	48.5	60.3	45.1
(2025/03/22 16:27:02.00)	49.6	63.8	46.2
(2025/03/22 16:30:02.00)	50.7	67.5	45.8
(2025/03/22 16:33:02.00)	53.4	70.5	46.9
(2025/03/22 16:36:02.00)	49.6	66.8	45.1
(2025/03/22 16:39:02.00)	54.8	76.2	48.2
(2025/03/22 16:42:02.00)	51.7	67.8	48
(2025/03/22 16:45:02.00)	51.2	66.2	47.9
(2025/03/22 16:48:02.00)	53.1	69.5	48.8
(2025/03/22 16:51:02.00)	52	70.4	47.8
(2025/03/22 16:54:02.00)	49.6	60.8	46.5
(2025/03/22 16:57:02.00)	51.8	65.2	47.6
(2025/03/22 17:00:02.00)	51.8	68.3	46.9
(2025/03/22 17:03:02.00)	50.8	64.3	46.2
(2025/03/22 17:06:02.00)	50.4	63.7	46.2
(2025/03/22 17:09:02.00)	49.6	62.7	45.4

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(2025/03/22 17:12:02.00)	50	60.5	45.1
(2025/03/22 17:15:02.00)	49.4	59.8	45.4
(2025/03/22 17:18:02.00)	50.7	68.4	46.8
(2025/03/22 17:21:02.00)	52.2	65.8	45.7
(2025/03/22 17:24:02.00)	54.6	69.3	49.6
(2025/03/22 17:27:02.00)	51.3	64.4	45.9
(2025/03/22 17:30:02.00)	51.3	59.9	46.8
(2025/03/22 17:33:02.00)	49.1	59.5	44.7
(2025/03/22 17:36:02.00)	52.6	67.7	47
(2025/03/22 17:39:02.00)	51.4	62.4	46.8
(2025/03/22 17:42:02.00)	49.3	66.5	45.3
(2025/03/22 17:45:02.00)	49.3	64.6	46.6
(2025/03/22 17:48:02.00)	49.3	61.7	45.5
(2025/03/22 17:51:02.00)	50.7	64.6	43.9
(2025/03/22 17:54:02.00)	47.3	56.4	44.5
(2025/03/22 17:57:02.00)	45.7	61.1	41.1
(2025/03/22 18:00:02.00)	46.1	49.7	43
(2025/03/22 18:03:02.00)	45.4	49.9	42.1
(2025/03/22 18:06:02.00)	45.9	53.4	41.9
(2025/03/22 18:09:02.00)	47	54	42.7
(2025/03/22 18:12:02.00)	50.1	64.1	44.1
(2025/03/22 18:15:02.00)	48.7	58.3	42.5
(2025/03/22 18:18:02.00)	47.9	56.5	43.6
(2025/03/22 18:21:02.00)	48.7	52.6	44.2
(2025/03/22 18:24:02.00)	49.7	54.6	47.5
(2025/03/22 18:27:02.00)	48.2	53.3	46.2
(2025/03/22 18:30:02.00)	48.6	55.4	45.2
(2025/03/22 18:33:02.00)	48.4	53.5	45.2
(2025/03/22 18:36:02.00)	49	55	44.3
(2025/03/22 18:39:02.00)	48.5	53.3	46.1
(2025/03/22 18:42:02.00)	48.1	54.9	44.9
(2025/03/22 18:45:02.00)	47.4	53.4	43.5
(2025/03/22 18:48:02.00)	48.1	52.1	46.1
(2025/03/22 18:51:02.00)	49.1	55.8	45.2
(2025/03/22 18:54:02.00)	49.4	56.2	46.2
(2025/03/22 18:57:02.00)	48.2	57.9	45.7
(2025/03/22 19:00:02.00)	46.9	51.5	44.3
(2025/03/22 19:03:02.00)	47.7	54.9	43.5
(2025/03/22 19:06:02.00)	48.9	67	44
(2025/03/22 19:09:02.00)	48	60.4	41.5
(2025/03/22 19:12:02.00)	47.2	52.8	43.8
(2025/03/22 19:15:02.00)	47.3	56.5	43.2
(2025/03/22 19:18:02.00)	46.3	55.3	43.1
(2025/03/22 19:21:02.00)	47.2	62.9	43.6
(2025/03/22 19:24:02.00)	45.3	49.6	41.5
(2025/03/22 19:27:02.00)	46.1	52.3	43.5
(2025/03/22 19:30:02.00)	45	50.3	41.2
(2025/03/22 19:33:02.00)	47	54.3	41.7

HHC – Internal Noise Break out Assessment – Window Open

(2025/03/22 19:36:02.00)	45.5	49.9	41.8
(2025/03/22 19:39:02.00)	45	51.7	41.1
(2025/03/22 19:42:02.00)	45.8	52.1	43.3
(2025/03/22 19:45:02.00)	44.5	49.1	40.8
(2025/03/22 19:48:02.00)	44.8	52.1	42.5
(2025/03/22 19:51:02.00)	45.2	50.5	41.5
(2025/03/22 19:54:02.00)	48.8	63	42.6
(2025/03/22 19:57:02.00)	45.4	51.1	41.3
(2025/03/22 20:00:02.00)	44.1	52.1	39.1
(2025/03/22 20:03:02.00)	47.4	54.9	41.9
(2025/03/22 20:06:02.00)	45.7	50.8	40.7
(2025/03/22 20:09:02.00)	45.7	51.9	41.5
(2025/03/22 20:12:02.00)	45.3	51.5	41.6
(2025/03/22 20:15:02.00)	46.8	54.5	41.8
(2025/03/22 20:18:02.00)	43.6	48.7	41.2
(2025/03/22 20:21:02.00)	45.3	50.6	40.6
(2025/03/22 20:24:02.00)	44.4	48.8	41.4
(2025/03/22 20:27:02.00)	44.9	57	42
(2025/03/22 20:30:02.00)	46	61.1	39.9
(2025/03/22 20:33:02.00)	44.9	56.3	42.2
(2025/03/22 20:36:02.00)	43.5	49.4	39.1
(2025/03/22 20:39:02.00)	44.3	49.2	41.6
(2025/03/22 20:42:02.00)	46.6	61.7	40
(2025/03/22 20:45:02.00)	47	58.6	41.3
(2025/03/22 20:48:02.00)	42.7	50.3	39.4
(2025/03/22 20:51:02.00)	43.7	50.8	39
(2025/03/22 20:54:02.00)	45	51.1	41.2
(2025/03/22 20:57:02.00)	44.6	49.9	41
(2025/03/22 21:00:02.00)	44.2	51.4	40.5
(2025/03/22 21:03:02.00)	44.4	49.9	40.2
(2025/03/22 21:06:02.00)	43.4	53.5	38.7
(2025/03/22 21:09:02.00)	42.8	49.7	39
(2025/03/22 21:12:02.00)	43.4	49	40.1
(2025/03/22 21:15:02.00)	44.4	49.9	40.3
(2025/03/22 21:18:02.00)	43.3	49.1	40.7
(2025/03/22 21:21:02.00)	51	68.9	43.1
(2025/03/22 21:24:02.00)	50.2	68.4	42.7
(2025/03/22 21:27:02.00)	46.4	60.4	41.8
(2025/03/22 21:30:02.00)	44	52.3	40.2
(2025/03/22 21:33:02.00)	47	52.5	42.8
(2025/03/22 21:36:02.00)	49.3	60.3	42.6
(2025/03/22 21:39:02.00)	45.1	51.1	40.8
(2025/03/22 21:42:02.00)	46.2	50.7	43.6
(2025/03/22 21:45:02.00)	49.1	59.6	41.2
(2025/03/22 21:48:02.00)	43.6	49.5	40.8
(2025/03/22 21:51:02.00)	45.2	54.2	41.4
(2025/03/22 21:54:02.00)	43.3	48.5	40.7
(2025/03/22 21:57:02.00)	46.3	56.6	42.7

HHC - Internal Noise Break out Assessment – Window Open

(2025/03/22 22:00:02.00)	43.8	48.4	41.3
(2025/03/22 22:03:02.00)	44	51.1	40.2
(2025/03/22 22:06:02.00)	44.5	50.3	41.6
(2025/03/22 22:09:02.00)	44.5	49.9	40.1
(2025/03/22 22:12:02.00)	44.1	49.3	40.7
(2025/03/22 22:15:02.00)	44	49.9	41.4
(2025/03/22 22:18:02.00)	44.7	52.7	40.4
(2025/03/22 22:21:02.00)	42.9	46.9	39.1
(2025/03/22 22:24:02.00)	44	48.7	41
(2025/03/22 22:27:02.00)	48.2	60.8	42.1
(2025/03/22 22:30:02.00)	44.4	53.8	41.1
(2025/03/22 22:33:02.00)	44.8	50.2	41
(2025/03/22 22:36:02.00)	44.5	51.4	40.5
(2025/03/22 22:39:02.00)	42.4	46.6	39.9
(2025/03/22 22:42:02.00)	43.9	50.9	40.9
(2025/03/22 22:45:02.00)	43.1	48.5	41.6
(2025/03/22 22:48:02.00)	43.1	48.7	39.4
(2025/03/22 22:51:02.00)	43.1	50.3	39.4
(2025/03/22 22:54:02.00)	43.5	50.3	38.4
(2025/03/22 22:57:02.00)	42.7	48.2	39.5
(2025/03/22 23:00:02.00)	42.1	45.7	39.5
(2025/03/22 23:03:02.00)	41.8	48.4	39
(2025/03/22 23:06:02.00)	43.7	48.3	41
(2025/03/22 23:09:02.00)	42.7	47.3	40
(2025/03/22 23:12:02.00)	43.5	49.2	40.1
(2025/03/22 23:15:02.00)	43.2	50.5	39.4
(2025/03/22 23:18:02.00)	43.7	48.7	40
(2025/03/22 23:21:02.00)	44.5	50.3	41.3
(2025/03/22 23:24:02.00)	43	50.3	40
(2025/03/22 23:27:02.00)	42.5	48.6	39.6
(2025/03/22 23:30:02.00)	42	48.6	39.2
(2025/03/22 23:33:02.00)	43.7	50	39.2
(2025/03/22 23:36:02.00)	41.3	46.7	38.3
(2025/03/22 23:39:02.00)	40.9	51.9	36.1
(2025/03/22 23:42:02.00)	40.7	44.8	38.6
(2025/03/22 23:45:02.00)	42.1	48.4	36.4
(2025/03/22 23:48:02.00)	42.4	47.5	38.9
(2025/03/22 23:51:02.00)	43.9	51	40
(2025/03/22 23:54:02.00)	41.5	49.9	37.7
(2025/03/22 23:57:02.00)	41.4	48.1	37.3
(2025/03/23 00:00:02.00)	43.8	55.3	39.8
(2025/03/23 00:03:02.00)	43.1	49.1	38.3
(2025/03/23 00:06:02.00)	44.4	51.4	39.3
(2025/03/23 00:09:02.00)	41.4	48	37.3
(2025/03/23 00:12:02.00)	44.2	55.5	38
(2025/03/23 00:15:02.00)	41.5	46.7	37.6
(2025/03/23 00:18:02.00)	43.5	54.5	39.1
(2025/03/23 00:21:02.00)	39.8	45.8	36.2

HHC – Internal Noise Break out Assessment – Window Open

(2025/03/23 00:24:02.00)	42.9	50.6	37.3
(2025/03/23 00:27:02.00)	44.4	57.3	38.4
(2025/03/23 00:30:02.00)	41.2	48.7	37.5
(2025/03/23 00:33:02.00)	38.5	48.2	34.5
(2025/03/23 00:36:02.00)	38.6	44.1	36.2
(2025/03/23 00:39:02.00)	41	45.3	36.2
(2025/03/23 00:42:02.00)	39.9	44.4	36.9
(2025/03/23 00:45:02.00)	38.9	44.1	36.1
(2025/03/23 00:48:02.00)	38	42.7	34.6
(2025/03/23 00:51:02.00)	38.4	44.4	33.8
(2025/03/23 00:54:02.00)	37.5	42.3	34
(2025/03/23 00:57:02.00)	37.9	43.4	32.9
(2025/03/23 01:00:02.00)	36.3	50.8	32.3
(2025/03/23 01:03:02.00)	38.9	49.1	34.3
(2025/03/23 01:06:02.00)	36.9	42.5	32.2
(2025/03/23 01:09:02.00)	38	46.7	34.6
(2025/03/23 01:12:02.00)	37.1	44	32.3
(2025/03/23 01:15:02.00)	36	47	32.3
(2025/03/23 01:18:02.00)	34.4	42.4	30
(2025/03/23 01:21:02.00)	37.1	43	31.2
(2025/03/23 01:24:02.00)	35.4	43.2	31.8
(2025/03/23 01:27:02.00)	36	43.9	32.1
(2025/03/23 01:30:02.00)	33.3	37.8	31.1
(2025/03/23 01:33:02.00)	36.6	46.2	30.7
(2025/03/23 01:36:02.00)	37	42.5	33.2
(2025/03/23 01:39:02.00)	35.5	45.6	30.4
(2025/03/23 01:42:02.00)	36.3	44.9	28.8
(2025/03/23 01:45:02.00)	36.7	46.8	28.7
(2025/03/23 01:48:02.00)	35.4	43.9	28
(2025/03/23 01:51:02.00)	34.1	41	29.9
(2025/03/23 01:54:02.00)	31.1	48	27.4
(2025/03/23 01:57:02.00)	35.6	45.4	28.8
(2025/03/23 02:00:02.00)	33.8	46.1	30.2
(2025/03/23 02:03:02.00)	30.2	39.8	27.6
(2025/03/23 02:06:02.00)	35.8	47.9	26.9
(2025/03/23 02:09:02.00)	36.2	46.9	28.1
(2025/03/23 02:12:02.00)	35.6	50.5	27.9
(2025/03/23 02:15:02.00)	38.8	53.8	29.2
(2025/03/23 02:18:02.00)	34.2	48.1	28.8
(2025/03/23 02:21:02.00)	39.9	53.6	28.8
(2025/03/23 02:24:02.00)	37.7	52.4	29.5
(2025/03/23 02:27:02.00)	35	45.9	28.8
(2025/03/23 02:30:02.00)	32.4	45	27
(2025/03/23 02:33:02.00)	35.2	45.8	28.4
(2025/03/23 02:36:02.00)	36.6	47.9	30.6
(2025/03/23 02:39:02.00)	36.7	45.4	30.3
(2025/03/23 02:42:02.00)	36.3	43.1	28.7
(2025/03/23 02:45:02.00)	36.1	44.8	29

HHC - Internal Noise Break out Assessment – Window Open

(2025/03/23 02:48:02.00)	36.5	47.6	28.6
(2025/03/23 02:51:02.00)	36.4	47.8	28.7
(2025/03/23 02:54:02.00)	38.8	51	31.1
(2025/03/23 02:57:02.00)	36.1	47.8	29.2
(2025/03/23 03:00:02.00)	39.8	49.6	31.7
(2025/03/23 03:03:02.00)	35.1	44.2	30.8
(2025/03/23 03:06:02.00)	38.7	52.9	29.6
(2025/03/23 03:09:02.00)	36.5	49	28.8
(2025/03/23 03:12:02.00)	38	48.8	30.6
(2025/03/23 03:15:02.00)	37.4	48.7	29.3
(2025/03/23 03:18:02.00)	31.6	41.2	28.1
(2025/03/23 03:21:02.00)	36.1	49	28.8
(2025/03/23 03:24:02.00)	37.1	49.4	30.4
(2025/03/23 03:27:02.00)	33.4	40.4	30.4
(2025/03/23 03:30:02.00)	35.6	44.4	30.6
(2025/03/23 03:33:02.00)	37.6	46.9	32.5
(2025/03/23 03:36:02.00)	39.9	48.6	33
(2025/03/23 03:39:02.00)	39.6	52.3	32.8
(2025/03/23 03:42:02.00)	36.6	46.3	28.1
(2025/03/23 03:45:02.00)	35.9	43.6	30.4
(2025/03/23 03:48:02.00)	37.4	50	29.9
(2025/03/23 03:51:02.00)	35.9	47.2	28.5
(2025/03/23 03:54:02.00)	32.6	45	28.3
(2025/03/23 03:57:02.00)	42.6	55.2	33.1
(2025/03/23 04:00:02.00)	35.3	42.4	30.8
(2025/03/23 04:03:02.00)	37	45.8	28.9
(2025/03/23 04:06:02.00)	39.9	52.5	29.6
(2025/03/23 04:09:02.00)	36.3	48.8	31.2
(2025/03/23 04:12:02.00)	35.7	47.2	31.2
(2025/03/23 04:15:02.00)	36.3	44.5	31.7
(2025/03/23 04:18:02.00)	33.1	40.3	30.4
(2025/03/23 04:21:02.00)	34.3	41.1	31
(2025/03/23 04:24:02.00)	34.5	40.9	31
(2025/03/23 04:27:02.00)	34.9	43.6	31.3
(2025/03/23 04:30:02.00)	35.7	45.2	30.4
(2025/03/23 04:33:02.00)	40.2	46.6	34.6
(2025/03/23 04:36:02.00)	40.2	46.7	36.1
(2025/03/23 04:39:02.00)	36.4	45.1	33.7
(2025/03/23 04:42:02.00)	43.6	57.8	35.5
(2025/03/23 04:45:02.00)	41.4	56.2	33.9
(2025/03/23 04:48:02.00)	43.1	56.2	35
(2025/03/23 04:51:02.00)	44.2	59.8	34.4
(2025/03/23 04:54:02.00)	46.1	57.4	35.7
(2025/03/23 04:57:02.00)	46	59.6	35.1
(2025/03/23 05:00:02.00)	45.4	57.6	36.4
(2025/03/23 05:03:02.00)	45.7	57.9	36.1
(2025/03/23 05:06:02.00)	45.2	58.6	37
(2025/03/23 05:09:02.00)	45.3	56.1	37.7

HHC – Internal Noise Break out Assessment – Window Open

(2025/03/23 05:12:02.00)	45	56.8	38
(2025/03/23 05:15:02.00)	44.6	56.7	38.8
(2025/03/23 05:18:02.00)	44.8	55.6	37.8
(2025/03/23 05:21:02.00)	46.2	56.9	38.4
(2025/03/23 05:24:02.00)	46.2	57	38.3
(2025/03/23 05:27:02.00)	47.4	60.6	38
(2025/03/23 05:30:02.00)	45.7	59.6	37.6
(2025/03/23 05:33:02.00)	41.7	51.5	37.2
(2025/03/23 05:36:02.00)	46	61.6	37
(2025/03/23 05:39:02.00)	47.2	60.4	38.8
(2025/03/23 05:42:02.00)	43.8	58.1	36.8
(2025/03/23 05:45:02.00)	43	59	37.6
(2025/03/23 05:48:02.00)	45.4	58.4	36.2
(2025/03/23 05:51:02.00)	43.3	54.9	38.5
(2025/03/23 05:54:02.00)	44.2	50.6	40.2
(2025/03/23 05:57:02.00)	44.7	55.3	37
(2025/03/23 06:00:02.00)	45.9	54.5	38.2
(2025/03/23 06:03:02.00)	47.1	62.8	37.8
(2025/03/23 06:06:02.00)	43.7	61.8	38
(2025/03/23 06:09:02.00)	47.5	62.7	39.5
(2025/03/23 06:12:02.00)	46.2	57.5	41.7
(2025/03/23 06:15:02.00)	45.1	55.6	40.2
(2025/03/23 06:18:02.00)	41.2	50.5	37.2
(2025/03/23 06:21:02.00)	45.4	56.4	37.8
(2025/03/23 06:24:02.00)	43.6	54.4	36.6
(2025/03/23 06:27:02.00)	41.6	54.9	35.9
(2025/03/23 06:30:02.00)	46	60.9	39.4
(2025/03/23 06:33:02.00)	45.9	58.1	40.1
(2025/03/23 06:36:02.00)	52.7	67.3	39.8
(2025/03/23 06:39:02.00)	53.4	69.5	41.3
(2025/03/23 06:42:02.00)	49.3	65.4	41.5
(2025/03/23 06:45:02.00)	47.5	58.3	40.9
(2025/03/23 06:48:02.00)	51.5	62.3	43.5
(2025/03/23 06:51:02.00)	48.3	61	40.7
(2025/03/23 06:54:02.00)	44	58.8	38.3
(2025/03/23 06:57:02.00)	45.5	57	38.7
(2025/03/23 07:00:02.00)	47.9	61.6	39.7
(2025/03/23 07:03:02.00)	44.1	54.6	39.5
(2025/03/23 07:06:02.00)	47.1	59.9	37.5
(2025/03/23 07:09:02.00)	45.5	55.7	38.8
(2025/03/23 07:12:02.00)	47.9	61.1	38.3
(2025/03/23 07:15:02.00)	45.2	58.7	39
(2025/03/23 07:18:02.00)	43.9	58.4	39.3
(2025/03/23 07:21:02.00)	43.6	56.3	40.4
(2025/03/23 07:24:02.00)	45.1	59.3	38.2
(2025/03/23 07:27:02.00)	47.3	58.4	40.2
(2025/03/23 07:30:02.00)	52	67	40.1
(2025/03/23 07:33:02.00)	52.8	63.1	45.8

HHC - Internal Noise Break out Assessment – Window Open

(2025/03/23 07:36:02.00)	49	59.2	41.6
(2025/03/23 07:39:02.00)	46	55	42.1
(2025/03/23 07:42:02.00)	46.8	58.9	41.5
(2025/03/23 07:45:02.00)	43.9	52.2	40.5
(2025/03/23 07:48:02.00)	41.7	47.6	38.4
(2025/03/23 07:51:02.00)	43.6	57.4	38.8
(2025/03/23 07:54:02.00)	48.2	64.6	38
(2025/03/23 07:57:02.00)	41.9	54.1	37.8
(2025/03/23 08:00:02.00)	46.1	66.9	39.3
(2025/03/23 08:03:02.00)	43.4	58.6	39.2
(2025/03/23 08:06:02.00)	44.2	54.6	38.2
(2025/03/23 08:09:02.00)	43.5	52.6	37.8
(2025/03/23 08:12:02.00)	46.3	65.8	39.5
(2025/03/23 08:15:02.00)	46.3	58.8	41.7
(2025/03/23 08:18:02.00)	46.4	57.3	42.4
(2025/03/23 08:21:02.00)	43.4	49.4	40.8
(2025/03/23 08:24:02.00)	43.8	53.3	40.1
(2025/03/23 08:27:02.00)	43.2	52	39.3
(2025/03/23 08:30:02.00)	44.9	61.8	39
(2025/03/23 08:33:02.00)	43.9	59.5	40.5
(2025/03/23 08:36:02.00)	46.3	61.9	39.9
(2025/03/23 08:39:02.00)	45.4	57.4	41.5
(2025/03/23 08:42:02.00)	44.5	50.5	42.3
(2025/03/23 08:45:02.00)	43.5	51.8	40.1
(2025/03/23 08:48:02.00)	43.6	49.1	39.3
(2025/03/23 08:51:02.00)	47.8	56.8	43.7
(2025/03/23 08:54:02.00)	46.2	60.3	42.3
(2025/03/23 08:57:02.00)	45.5	57.4	41.5
(2025/03/23 09:00:02.00)	44.4	57.4	40.4
(2025/03/23 09:03:02.00)	49.8	69.5	43.2
(2025/03/23 09:06:02.00)	47.5	59.7	42.3
(2025/03/23 09:09:02.00)	45.8	59.8	41
(2025/03/23 09:12:02.00)	47.3	63.5	42.8
(2025/03/23 09:15:02.00)	46.5	57.7	42.6
(2025/03/23 09:18:02.00)	46.5	61.4	42.8
(2025/03/23 09:21:02.00)	46	61.8	41.4
(2025/03/23 09:24:02.00)	48	61.4	42.2
(2025/03/23 09:27:02.00)	47.2	61.1	42.2
(2025/03/23 09:30:02.00)	46.5	60.9	43.3
(2025/03/23 09:33:02.00)	46.7	60.6	42.5
(2025/03/23 09:36:02.00)	44.1	56	41.2
(2025/03/23 09:39:02.00)	43	52.3	40.1
(2025/03/23 09:42:02.00)	48.3	62.1	43.1
(2025/03/23 09:45:02.00)	48.2	61.5	44.1
(2025/03/23 09:48:02.00)	47.7	56.5	44.7
(2025/03/23 09:51:02.00)	51.1	59.2	45
(2025/03/23 09:54:02.00)	52.1	61.9	45.2
(2025/03/23 09:57:02.00)	53.7	61.8	45.2

HHC – Internal Noise Break out Assessment – Window Open

(2025/03/23 10:00:02.00)	51.2	58.7	45.6
(2025/03/23 10:03:02.00)	49.5	59	45.7
(2025/03/23 10:06:02.00)	50.8	63	45
(2025/03/23 10:09:02.00)	54.5	72.2	47.2
(2025/03/23 10:12:02.00)	55.3	73.4	47
(2025/03/23 10:15:02.00)	48.3	58	45.7
(2025/03/23 10:18:02.00)	48.4	56.6	45.7
(2025/03/23 10:21:02.00)	49.9	58.4	47.3
(2025/03/23 10:24:02.00)	48.9	55.5	44.7
(2025/03/23 10:27:02.00)	48.8	56.1	44.7
(2025/03/23 10:30:02.00)	49.7	62	45.3
(2025/03/23 10:33:02.00)	51	64.4	46.1
(2025/03/23 10:36:02.00)	51.9	64.8	46.9
(2025/03/23 10:39:02.00)	49.3	61.9	45
(2025/03/23 10:42:02.00)	57	72.1	46.2
(2025/03/23 10:45:02.00)	48.9	65.3	45.2
(2025/03/23 10:48:02.00)	52.8	62.7	46.1
(2025/03/23 10:51:02.00)	50.2	65.3	47.1
(2025/03/23 10:54:02.00)	50.8	61.6	46.7
(2025/03/23 10:57:02.00)	52.6	66.1	47.5
(2025/03/23 11:00:02.00)	54.6	69.4	48.8
(2025/03/23 11:03:02.00)	52	65	46.3
(2025/03/23 11:06:02.00)	50	63.5	46.2
(2025/03/23 11:09:02.00)	49.3	61.1	45.7
(2025/03/23 11:12:02.00)	51.7	63.4	47
(2025/03/23 11:15:02.00)	50.3	65.4	46.8
(2025/03/23 11:18:02.00)	50.2	64.8	45.8
(2025/03/23 11:21:02.00)	50.3	60.5	45.7
(2025/03/23 11:24:02.00)	50	60.2	46.1
(2025/03/23 11:27:02.00)	50.7	62.9	45.4
(2025/03/23 11:30:02.00)	52.3	60.8	47.3
(2025/03/23 11:33:02.00)	53.1	71.5	48
(2025/03/23 11:36:02.00)	49.9	63.5	43.8
(2025/03/23 11:39:02.00)	52	68.3	47.1
(2025/03/23 11:42:02.00)	51.7	65.7	46
(2025/03/23 11:45:02.00)	50.4	58.4	46.1
(2025/03/23 11:48:02.00)	49.7	61	46.3
(2025/03/23 11:51:02.00)	50.2	59.2	46.3
(2025/03/23 11:54:02.00)	50.3	62.2	46.6
(2025/03/23 11:57:02.00)	50.6	63.3	45.7
(2025/03/23 12:00:02.00)	49.9	64.5	45.5
(2025/03/23 12:03:02.00)	51.2	64.8	48.2
(2025/03/23 12:06:02.00)	51.1	67.4	48.6
(2025/03/23 12:09:02.00)	49.4	66.3	45.5
(2025/03/23 12:12:02.00)	49.7	61	45.3
(2025/03/23 12:15:02.00)	49.3	60.8	45.7
(2025/03/23 12:18:02.00)	49.9	67.9	45.9
(2025/03/23 12:21:02.00)	50.8	60.1	46.5

