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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : New Century Hall, NOMA

REF : HT: 26658/PTM1

DATE : 23 June 2022

FROM : Joe Sinker

ISSUED TO : Client Team

RE: NEW CENTURY HALL, NOMA PLANNING CONDITION 11 – COMMISSIONING NOTE

1.0 Introduction

Hann Tucker Associates have been appointed to carry out commissioning testing to assist in the discharge of Planning Condition 11 imposed on the New Century Hall redevelopment. Planning Condition 11 states the following:

“11) Before any use hereby approved commences a scheme for acoustically insulation any adjacent noise sensitive uses from noise from (a) the basement college, (b) the ground floor bar/restaurant and (c) the first floor venue shall be submitted to and approved in writing by the City Council as local planning authority.

Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined properties in the 63Hz and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.

Any approved additional noise insulation shall be completed before each of the approved uses commence.

Prior to occupation a post completion report to verify that any recommended additional mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in adjacent accommodation arising directly from the proposed development shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non-compliance shall be suitably mitigated in accordance with an agreed scheme.

Sponsor Member of The Institute of Acoustics; Members of UKELA & IEMA, The Association of Noise Consultants,
A UKAS Accredited testing laboratory No.4083 for Sound Insulation and Air Tightness Testing; ISO 9001 Accredited
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Reason - To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1 and DM1 of the Core Strategy and saved UDP Policy DC26."

This memo provides our testing methodology and assessment of potential noise egress from the noise generating uses of the development.

2.0 Test Methodology

In-situ testing of noise transfer from the internal ground floor bar/restaurant area and first floor venue to external receptors was undertaken between approximately 18:00 and 20:00 hours on 10 May 2022. Internal noise levels were generated using a portable speaker in the ground floor bar/restaurant area and using a mock-up PA system in the first-floor venue hall, this PA system was hired temporarily by the client and was representative of the system that will be installed once the unit is operational.

Measurements were undertaken within the source room, externally at an approximate distance of 1m from each façade of New Century Hall, and at a location representative of the nearest residential receptors approximately 95m to the north.

Due to the presence of extraneous external noise from the local road traffic network additional measurements were undertaken to establish the prevailing ambient noise climate without the pink noise present.

All tests were conducted using pink noise as the sound source. The level of the noise source was set by the client operative to be representative of the maximum levels that would be generated when the space is operational. The levels within each octave band were also approximately equal to the levels used to predict the noise output from the site in the planning stage report prepared by Hann Tucker Associates (ref HT26658/NIA1 dated 26 July 2019).

All measurements were made using the following sound level meter and associated calibrator:

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Precision Sound Level Meter	Brüel and Kjær	2250	3025397	28/10/2020
Type 1 Calibrator	Brüel and Kjær	4231	2271905	02/11/2021



3.0 Measurement Results

The following table presents the measured octave band noise levels for the various combinations of source and measurement locations:

Description	L _{Aeq} Noise Level (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Within Venue Hall	112	104	94	89	89	93	95
1m from North Façade (Source in Venue Hall)	75	64	61	61	61	58	51
1m from East Façade (Source in Venue Hall)	79	69	61	57	57	53	47
1m from South Façade (Source in Venue Hall)	73	59	53	52	51	47	39
Nearest Resi Receptor (Source in Venue Hall)	75	69	64	61	64	59	50
Within Restaurant/Bar	96	99	94	90	88	85	83
1m from North Façade (Source in Restaurant/Bar)	76	71	63	58	58	55	48
1m from South Façade (Source in Restaurant/Bar)	80	86	78	69	69	63	61
1m from North Façade (Ambient)	66	59	56	55	56	50	41
1m from East Façade (Ambient)	66	59	58	58	60	55	45
1m from South Façade (Ambient)	67	56	51	50	49	45	37
Nearest Resi Receptor (Ambient 1)	65	61	60	60	62	57	47
Nearest Resi Receptor (Ambient 2)	73	64	64	63	66	61	51

4.0 Measurement Observations

During the measurement period it was noted that although the façade of the venue hall was fully completed, the facades of the ground floor bar/restaurant were incomplete, and some holes were present.

Although measurements were undertaken as late as was possible during the measurements periods there was still significant traffic on the surrounding road network. The presence of road traffic noise is expected due to the site's city centre location, and the RTN is a documented primary component of the prevailing noise climate at the site.



It was noted that at the nearest noise sensitive receptor, approximately 95m to the northwest of the site, noise from the pink noise source within the building was inaudible over the ambient noise climate.

With the noise source switched on in the first-floor venue hall noise was generally inaudible in proximity to the facades of New Century Hall with the exception of a low frequency rumble which was just audible. Comparison of the noise levels measured at the building facades with and without the pink noise source present also corroborate this observation as only the 63Hz and 125Hz octave bands shows an increase when the pink noise source was active.

5.0 Planning Stage Report

Hann Tucker Associates carried out a detailed noise impact assessment during planning stage and issued the report HT26658/NIA1 dated 26 July 2019 which sets out an assessment of noise egress and demonstrates theoretical compliance with the MCC criteria at the nearest receptors based on the following internal noise levels and estimated minimum sound reduction indices of the proposed facades.

Description	Reverberant Noise Level (dB L _{eq,1hr}) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Food Hall (busy bar with live band)	99	93	89	91	88	88	88	95
Venue Hall (music)	108	106	101	97	96	91	91	101

Description	Estimated Sound Reduction Index (dB R) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
FF Façade	41	45	51	59	63	67	70
GF Façade	12	17	20	26	32	33	30

We understand that there will be a coffee pod space within the ground floor which will feature a hatch in the southern façade of the ground floor restaurant/bar space. The coffee pod is only to be used between 07:00 and 17:00 hours, and will be utilised as a cloakroom accessed internally (with hatch closed) when music will be played.



We furthermore understand that the hatch will be constructed from the same material as the surrounding façade such that when closed, the hatch acts as a continuation of the southern façade and maintains its acoustic integrity.

6.0 Estimated Façade Performance

Due to the prevailing noise climate at the site it was not possible to accurately measure noise egress from within New Century Hall in isolation. As such, based on the measurements made in close proximity to the building facades we have calculated the approximate apparent sound reduction performance of the façade such that the performance can be compared to the estimated values utilised in the planning stage assessment for which corresponding assessment demonstrated egress noise levels should be suitably controlled.

It should be noted that due to the level of ambient noise present in octave bands above 125Hz, the calculated values at this level are limited and should therefore be considered a minimum.

Approximate apparent sound reduction indices have been calculated using the following formula

$$SRI = SPL_{int} - SPL_{ext} + 10\log(S) - 20\log(r) - 14$$

where: S is the area of the radiating surface and r is the distance from the surface

The following table presents the measured sound level difference between the internal and external noise levels within both the ground floor bar/restaurant and first floor venue hall and the calculated approximate apparent sound reduction indices.



Description	Noise Insulation Parameter (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
D North Façade FF	41	45	38	36	35	42	53
D East Façade FF	33	34	32	31	29	38	49
D South Façade FF	40	46	43	40	41	47	57
D North Façade GF	20	29	31	31	29	30	35
D South Façade GF	16	14	17	21	19	22	22
~R' North Façade FF	53	56	50	48	47	54	65
~R' East Façade FF	41	42	40	39	37	46	57
~R' South Façade FF	52	57	55	51	53	59	69
~R' North Façade GF	29	38	40	40	38	39	44
~R' South Façade GF	25	23	26	30	28	31	31

7.0 Discussion

The comparison of the measurement derived estimated apparent sound reduction performance and the planning-stage estimated sound reduction performance of the facades show the following:-

- The measurement derived approximate performance of the ground floor façade is equal to or better than the planning stage estimate at most octave bands;
- The measurement derived approximate performance of the first-floor façade at low frequencies (at which some noise egress was audible in close proximity to the façade) are very close to the planning stage estimated values;
- At octave bands above 125Hz the measurements derived estimates are limited by the ambient noise climate and are therefore a minimum, meaning it is likely that the actual performances exceed the planning stage estimate at these more easily attenuated frequencies.



In addition, as stated in Section 4.0, during the measurements undertaken at a position representative of the nearest residential dwellings on the corner of Corporation Street it was noted that noise from within New Century Hall was inaudible and could not be measured over the ambient traffic noise.

In view of the practical limitations in measuring noise egress from the proposed venue hall and bar/restaurant at the nearest residential receptor, it is proposed that the measurement derived estimation of the apparent sound reduction indices of the ground and first floor facades in tandem with the comparison with the planning stage estimated sound reduction indices and the subsequent calculations demonstrating compliance with the MCC criteria should be sufficient evidence to discharge Condition 11. This is on the basis that the internal noise levels presented in Section 8.0 of the planning stage report (ref HT26658/NIA1 dated 26 July 2019) should not be exceeded and should be ensured by use of a noise limiter if needed.

Yours sincerely

Joe Sinker
for HANN TUCKER ASSOCIATES