

# A13.4

**Baseline Noise  
Monitoring NCH  
and Gate Theatre**

Report for:

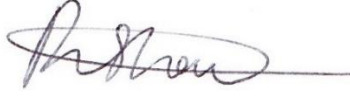


**Jacobs Engineering Ireland Ltd**

Metrolink

*Baseline Noise Monitoring at The National  
Concert Hall and Gate Theatre*

**Status: Final**

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## 1. INTRODUCTION

ACCON UK (ACCON) have been commissioned by Jacobs Engineering Ireland Ltd (Jacobs) on behalf of Transport Infrastructure Ireland to carry out baseline noise monitoring at sensitive locations within the Gate Theatre and the National Concert Hall in order to inform the assessment of noise and vibration for the proposed MetroLink railway line through Dublin City Centre. The noise measurements commenced on Thursday 6<sup>th</sup> February and were completed on Friday 7<sup>th</sup> February.

The purpose of the baseline noise monitoring is to ascertain the current existing levels of noise within the buildings.

The results of the baseline noise monitoring will be utilised to inform the baseline for the purpose of the Environmental Impact Assessment of the MetroLink project.

This report provides a summary of the noise monitoring equipment, the monitoring locations, baseline monitoring results and the sources of noise which were observed at each location.

## 2. MONITORING METHODOLOGY AND EQUIPMENT

### 2.1. Baseline Noise Monitoring Methodology

The Survey Scope indicated that baseline noise monitoring was required in three locations:

- The Auditorium at the National Concert Hall;
- The Rehearsal Room at the Gate Theatre; and
- The Auditorium at the Gate Theatre.

Each location required ten noise measurements, each of 15-minute duration. The microphone locations were all tailored to each specific room layout, as described for each monitoring location in **Section 3** of this report.

Sound level meters were set up on tripods with the microphone at a height of 1.5 m. Where possible sound level meters were not placed near reflective surfaces, apart from the floor.

### 2.2. Monitoring Equipment

The baseline noise measurements utilised two Svantek 971 Class 1 Sound Level Meters. The sound level meters hold current certificates of calibration, which are available upon request. Each sound level meter was field calibrated before and after the measurements at each site using a Norsonic 1251 Sound Level Calibrator to ensure that it had remained within reasonable calibration limits ( $\pm 0.5$  dB).

### 2.3. Monitoring Results

**Section 3** of this report presents a summary of the baseline noise monitoring results at each measurement location.

Due to the large volume of monitoring data obtained, the full monitoring results have been issued separately in electronic format, including the A-weighted and one-third octave band sound pressure levels from each measurement position.

### 3. NOISE MONITORING RESULTS

The noise monitoring survey was carried out at ten locations within each of the following: the rehearsal room and the auditorium in The Gate theatre and the main auditorium in the National Concert Hall. The monitoring positions were determined during the monitoring exercise based on the size and layout of each room, in order to obtain a spatial average of noise levels within each space.

This report provides a summary of the baseline noise measurements at each of the measurement positions. Various sound level indices are presented in the summary results for each measurement position.

#### 3.1. National Concert Hall, Auditorium

This room is located towards the rear of the National Concert Hall building, on the ground floor. The Auditorium was isolated from the foyer by a corridor.

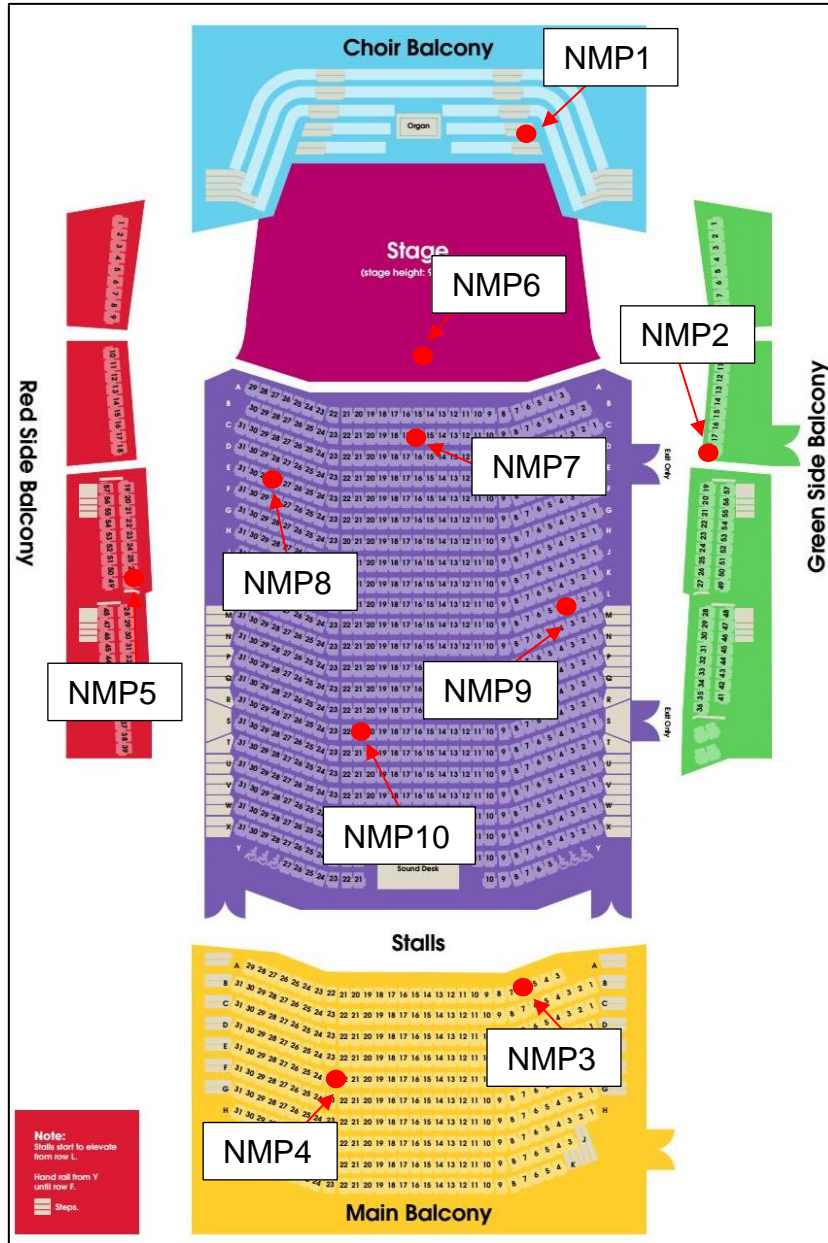
Ten noise measurement positions were utilised within this room as follows:

- Noise Measurement Position One (NMP1) was located at the front right of the choir balcony overlooking the stage;
- Noise Measurement Position Two (NMP2) was located on the green side balcony between seats eighteen and nineteen;
- Noise Measurement Position Three (NMP3) was located on the main balcony at row B, seat six;
- Noise Measurement Position Four (NMP4) was located on the main balcony at row F, seat twenty-three;
- Noise Measurement Position Five (NMP5) was located on the red side balcony at seat twenty-seven;
- Noise Measurement Position Six (NMP6) was located on the front of the stage towards the centre;
- Noise Measurement Position Seven (NMP7) was located in the stalls on row C, seat sixteen;
- Noise Measurement Position Eight (NMP8) was located in the stalls on row F, seat Thirty-two;
- Noise Measurement Position Nine (NMP9) was located in the stalls on row S, seat twenty-one;
- Noise Measurement Position Ten (NMP10) was located in the stalls on row M, seat three.

The ventilation system was switched off during the noise measurements. Throughout the measurement period, movement in the adjacent room was audible along with creaking of the stage.

**Figure 3.1** identifies the measurement positions within the auditorium of the National Concert Hall (NCH).

**Figure 3.1 Measurement Positions within the Auditorium of the NCH**



**Table 3.1** presents the results of the noise measurements at each of the noise measurement positions.



**Table 3.1 Summary of Noise Monitoring Results for the National Concert Hall**

Measurement Position	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax</sub> (dB)	L <sub>A10, T</sub> (dB)	L <sub>A90, T</sub> (dB)
NMP1	22	41	23	20
NMP2	27	54	24	21
NMP3	24	49	24	21
NMP4	22	40	23	20
NMP5	25	40	23	21
NMP6	23	48	23	21
NMP7	23	47	23	20
NMP8	23	50	23	20
NMP9	22	38	22	20
NMP10	22	39	23	20
<b>Average</b>	<b>24</b>	<b>54</b>	<b>23</b>	<b>21</b>

Note: The levels stated are logarithmic averages for L<sub>Aeq, T</sub> and arithmetic averages for L<sub>A10, T</sub> and L<sub>A90, T</sub>. The L<sub>AFmax</sub> is the maximum sound level measured during the measurement survey.

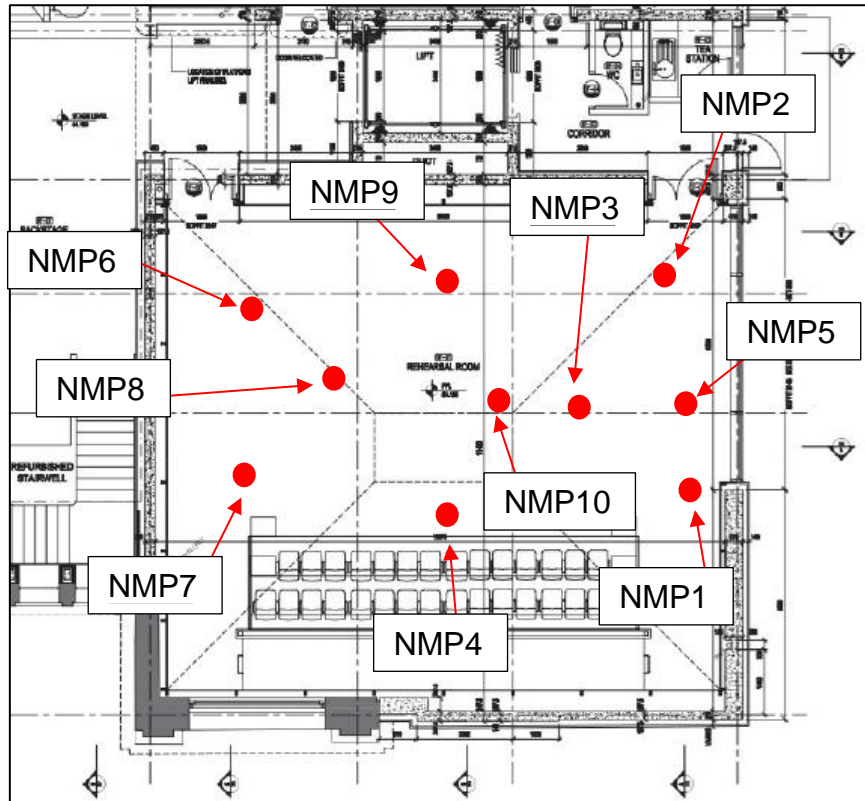
### 3.2. The Gate Theatre, Rehearsal Room

This room is located on level two of the Gate Theatre building. The ventilation system was operational for part of the measurement period as it was not possible to adjust the automatic controls.

Cars, vans and buses on the roads directly outside of the room were audible throughout the measurement period. Seagulls could also be heard. The ventilation system turned on for some periods and affected some of the measurements.

**Figure 3.2** identifies the noise measurement positions within the rehearsal room at the Gate theatre. **Table 3.2** presents the results of the noise monitoring. The measurements that were significantly influenced by noise from the ventilation system are identified in the table and separate averages are provided for the measurements that were not influenced by the ventilation noise.

**Figure 3.2 Measurement Positions for Gate Theatre, Rehearsal Room**



**Table 3.2 Summary of Noise Monitoring Results for the Gate Theatre, Rehearsal Room**

Measurement Position	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax</sub> (dB)	L <sub>A10,T</sub> (dB)	L <sub>A90,T</sub> (dB)
NMP1	29	45	32	23
NMP2	30	45	33	24
NMP3	26	44	32	24
NMP4*	41	75	35	30
NMP5*	41	75	35	30
NMP6	30	48	32	24
NMP7	28	44	31	23
NMP8	29	43	32	24
NMP9*	43	77	36	31
NMP10*	43	77	36	31
<b>Overall Average</b>	<b>38</b>	<b>77</b>	<b>33</b>	<b>26</b>

Measurement Position	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax</sub> (dB)	L <sub>A10, T</sub> (dB)	L <sub>A90, T</sub> (dB)
<b>Average of periods not affected by ventilation noise</b>	<b>29</b>	<b>48</b>	<b>32</b>	<b>24</b>

Note: The levels stated are logarithmic averages for L<sub>Aeq, T</sub> and arithmetic averages for L<sub>A10, T</sub> and L<sub>A90, T</sub>. The L<sub>AFmax</sub> is the maximum sound level measured during the measurement survey.

\* Measurements affected by ventilation noise.

### 3.3. The Gate Theatre, Auditorium

This room is located on the level two of the Gate Theatre building.

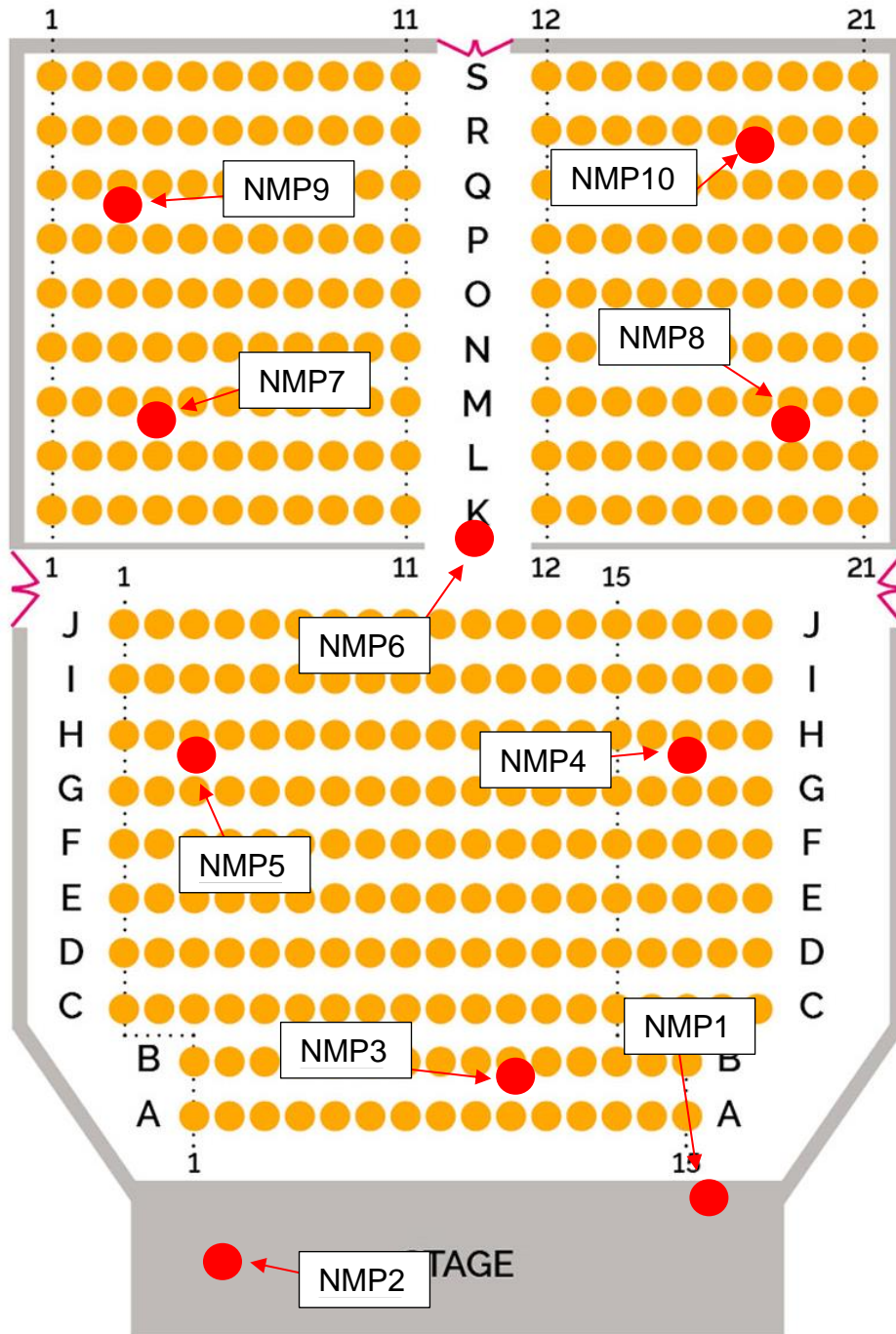
The traffic on the roads next to the Gate Theatre was audible throughout the measurements. This included airborne-induced vibration from the passage of heavy vehicles. People walking, talking and closing doors backstage affected the measurements and may be considered part of the existing baseline.

Ten noise measurement positions were utilised within this room on a tripod at a height as follows:

- Noise Measurement Position One (NMP1) was located on the right side on the stage towards the front;
- Noise Measurement Position Two (NMP2) was located on the left side of the stage;
- Noise Measurement Position Three (NMP3) was located on row B seat ten;
- Noise Measurement Position Four (NMP4) was located on row H, seat seventeen;
- Noise Measurement Position Five (NMP5) was located on row H, seat three;
- Noise Measurement Position Six (NMP6) was located in the centre aisle of row K;
- Noise Measurement Position Seven (NMP7) was located on row M, seat four;
- Noise Measurement Position Eight (NMP8) was located on row M, seat nineteen;
- Noise Measurement Position Nine (NMP9) was located on row Q, seat three;
- Noise Measurement Position Ten (NMP10) was located on row R, seat eighteen.

Error! Reference source not found. presents the results of the noise monitoring at the Auditorium of the Gate Theatre.

**Figure 3.3 Measurement Positions for Gate Theatre, Auditorium**



**Table 3.3 Summary of Noise Monitoring Results for the Gate Theatre, Auditorium**

Measurement Position	L <sub>Aeq,T</sub>	L <sub>AFmax</sub>	L <sub>A10,T</sub>	L <sub>A90,T</sub>
NMP1	32	59	31	28
NMP2	31	57	31	28
NMP3	30	51	28	25
NMP4	28	50	27	24
NMP5	28	54	26	23
NMP6	33	63	31	24
NMP7	27	54	27	24
NMP8	28	57	27	24
NMP9	27	49	27	23
NMP10	30	59	27	24
<b>Average</b>	<b>30</b>	<b>63</b>	<b>28</b>	<b>25</b>

Note: The levels stated are logarithmic averages for L<sub>Aeq,T</sub> and arithmetic averages for L<sub>A10,T</sub> and L<sub>A90,T</sub>. The L<sub>AFmax</sub> is the maximum sound level measured during the measurement survey.

## 4. CONCLUSION

This report presents the results of the baseline noise monitoring carried out at the National Concert Hall and The Gate Theatre, Dublin. This report has identified, in detail, the locations where noise was measured by ACCON during the baseline noise survey carried out between 6<sup>th</sup> February and 7<sup>th</sup> February 2020. The report provides summary tables of the noise levels for each measurement position. Detailed data including the one-third octave band data has been made available in a separate document.

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