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ATKINS
Member of the SNC-Lavalin Group

Project: National Paediatric Hospital

Report Type: Summary of Noise Vibration & Movement Monitoring Results

Period of Monitoring: 23rd November – 04th January

Introduction

Contained within the project documents for the National Children's Hospital development are requirements for Environmental Monitoring to be completed during construction works. This monitoring regime includes recording dust deposition, noise at the perimeter of the site, and ground vibration at the perimeter of the site. Permissible limits for each monitoring regime have been set out in the Project EIS which was submitted with the Planning Permission for the Hospital.

The number of Monitoring points will vary throughout the project depending on the construction works being undertaken. Additional monitoring points may be added if features of adjacent properties require it.

Works on site during this monitoring period include, but are not limited to:

O'Reilly Avenue/ Energy centre – Construction of upper levels; Steel works, Concrete Works, Loading Bay, Road resurface.
Hospital – Construction of upper levels, Interior works. Concrete works, loading bay area, FM tunnel preparations. Waste removal. Water pumping.
Cameron Square – Concrete works.
South Circular Road – Construction of upper levels, Interior works. Steel works, concrete works, HGV Loading bay.
Mount Brown – Waste removal, deliveries and ground works.
Brookfield Clinic – Concrete pump operational.
Energy Centre – Ground works.

Vibration Monitoring.

Vibration monitors have been located at the 'closest part of sensitive property' as per the Project Environmental Impact Statement where feasible or alternatively at the site hoarding. The monitors will be located as per the above adjacent to locations where significant works are ongoing on site.

The Project Environmental Impact Statement (EIS) that was part of the project Planning Permission established vibration limit at structures depending on their condition and type. Please see tables below for the limits set.

Table 11.7: Allowable vibration during construction phase for soundly constructed buildings

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
15 mm/s	20 mm/s	50 mm/s

Table 11.8: Allowable vibration during construction phase for sensitive buildings

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
3 mm/s	3 – 8 mm/s	8 – 10 mm/s

Site operations are monitored using a traffic light trigger system of Green, Amber and Red trigger levels with the Red trigger level set at a vibration limit of 3mm/s PPV which corresponds to the lowest permissible vibration limit for sensitive structures. Any vibration level recorded below Red levels is acceptable within the limits established in Planning.

Number of Monitors on Site:

During the monitoring period summarised for this report there were up to 16 active vibration monitors installed at the perimeter of the site.

Location of Vibration and Noise Monitors:

The layout of the monitors is as seen below:

Location of Noise and Vibration Monitors

There are concentrations of monitors at the boundaries with Cameron Square and O'Reilly Avenue where works have been ongoing on site in proximity to neighbouring properties.

Location of Noise and Vibration Monitors near O'Reilly Avenue

Observations:

Executive Summary:

Vibration monitors have been placed at the 'closest part of the sensitive properties' as per the EIS where this is feasible. Most vibration readings during the monitoring period recorded readings below the limit specified within the Project EIS. Vibration monitors V1, V13, V18, V19, V20 A1 & A2 have been excluded from this report as they are not relevant to the conditions for the residents adjacent to the site. From the remaining 11 monitors:

- 0 monitor recorded readings above the limit specified within the Project EIS.
- 0 monitors were offline during the timeframe covered in this report.

Detailed Summary:

Sensor (V2 – 3666) (James' Walk)

- The vibration unit V2 located at James's Walk no. 86 was de-installed on the 9th October 2019 after the house owner requested it.

Sensor (V3 – 8995) (South Circular Road)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V5 – 5037) (Cameron Square)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V6 - 5044) (Cameron Square)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V7 - 5017) (Old Kilmainham Road)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V8 - 5035) (Brookfield Clinic

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V9 – 5056) (O'Reilly Avenue)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V10 – 4183) (O'Reilly Avenue)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V11 – 8988) (O'Reilly Avenue)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V12 – 5043) (O'Reilly Avenue)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

Sensor (V14 - 3835) (South Circular Road) (formerly numbered 5056)

- All vibration readings recorded vibrations below the limit specified within the Project EIS.

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Noise Monitoring.

During the report period noise monitors have been placed at the 'closest part of sensitive property' as per the Project EIS where this has been feasible, or alternatively to the outside face of the site hoarding. When works are ongoing the noise monitor sensors run continuously, and readings are recorded in decibels (dB) LA_{eq1hr}. Decibels is the standard unit of measurement of sound energy and 'LA_{eq1hr}' means that sensors record all levels of sound over a 1-hour period and then calculate an average equivalent decibel level as if the sound was continuous. Isolated instantaneous loud noises are thus averaged out.

The Project Environmental Impact Statement (EIS) that was part of the project Planning Permission established a noise limit at residential dwellings of 70dB LA_{eq1hr}. Site operations are monitored using a traffic light trigger system of Green, Amber and Red trigger levels with the Red trigger level set at the noise limit set out in the project EIS (70 dB LA_{eq1hr}.). Any noise level recorded below Red levels is acceptable within the limits established in Planning.

Number of Noise Monitors on Site:

During the monitoring period summarised for this report there were up to 20 active monitors at the site boundaries.

Observations:

Executive Summary:

Noise monitors 07, 08, 15, 16, 17, 18, 19 & 20 have been excluded from this report as they are not relevant to the conditions for the residents adjacent to the site. From the remaining 12 monitors:

- 4 number monitors recorded readings above the limit specified within the Project EIS.

Detailed Summary:

The monitoring results for noise for this period were within the limits set out in the Project EIS with the following exceptions:

Monitor 01 (Cameron Square)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 02 (O'Reilly Avenue)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 03 (Mace)

- Noise levels above the limit specified within the Project EIS were breached as per the table below.

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Monitor 04 (Mount Brown Road)

- Noise levels above the limit specified within the Project EIS were breached as per the table below.

Monitor 05 (O'Reilly Avenue)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 06 (O'Reilly Avenue)

- Noise levels above the limit specified within the Project EIS were breached as per the table below.

Monitor 09 (James' Walk)

- The unit was de-installed on 9th October at the house owner's request.

Monitor 10 (Brookfield Clinic)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 11 (Cameron Square)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 12 (Cameron Square)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 13 (64 O'Reilly Avenue)

- All noise readings recorded noise levels below the limit specified within the Project EIS.

Monitor 14 (South Circular Road)

- Noise levels above the limit specified within the Project EIS were breached as per the table below.

Monitor	Date	1-hour limit breech	DCC 10hr limit breech	Reason for breech
N3	23.11.2020	Yes	No	This noise monitor is located on the busy road
N14	23.11.2020	Yes	Yes	This noise monitor is located on the busy road
N4	24.11.2020	Yes	No	This noise monitor is located on the busy road
N3	24.11.2020	Yes	No	This noise monitor is located on the busy road
N14	24.11.2020	Yes	No	This noise monitor is located on the busy road
N3	25.11.2020	Yes	No	This noise monitor is located on the busy road
N4	25.11.2020	Yes	No	This noise monitor is located on the busy road
N14	25.11.2020	Yes	Yes	Ambient traffic noise is responsible for the exceedances at this monitor. This monitor is located in a close proximity to the busy SCR. This monitor is constantly in breach, inclusive of outside of construction hours supporting the fact that they are construction related
N3	26.11.2020	Yes	No	This noise monitor is located on the busy road
N4	26.11.2020	Yes	No	This noise monitor is located on the busy road
N14	26.11.2020	Yes	No	Ambient traffic noise is responsible for the exceedances at this monitor. This monitor is located in a close proximity to the busy SCR. This monitor is

				constantly in breach, inclusive of outside of construction hours supporting the fact that they are construction related
N3	27.11.2020	Yes	No	This noise monitor is located on the busy road
N4	27.11.2020	Yes	No	This noise monitor is located on the busy road
N4	29.11.2020	Yes	No	This noise monitor is located on the busy road
N3	30.11.2020	Yes	No	This noise monitor is located on the busy road
N4	30.11.2020	Yes	No	This noise monitor is located on the busy road
N3	01.12.2020	Yes	No	This noise monitor is located on the busy road
N4	01.12.2020	Yes	No	This noise monitor is located on the busy road
N3	02.12.2020	Yes	Yes	This noise monitor is located on the busy road
N4	02.12.2020	Yes	No	This noise monitor is located on the busy road
N6	02.12.2020	Yes	No	There was concrete pumping activity on going on SCR (across from mace shop), this activity may have caused these exceedances. There were sound proofing barriers erected around the pump and mitigation blankets erected on fencing surrounding the lay by area for the concrete trucks.
N3	03.12.2020	Yes	No	Not deemed to be construction related
N4	03.12.2020	Yes	No	This noise monitor is located on the busy road
N3	04.12.2020	Yes	No	This noise monitor is located on the busy road
N4	04.12.2020	Yes	No	This noise monitor is located on the busy road
N3	05.12.2020	Yes	No	This noise monitor is located on the busy road
N4	05.12.2020	Yes	No	This noise monitor is located on the busy road
N3	06.12.2020	Yes	No	This noise monitor is located on the busy road
N4	06.12.2020	Yes	No	This noise monitor is located on the busy road
N3	07.12.2020	Yes	No	This noise monitor is located on the busy road
N4	07.12.2020	Yes	No	This noise monitor is located on the busy road
N3	08.12.2020	Yes	No	This noise monitor is located on the busy road
N4	08.12.2020	Yes	No	This noise monitor is located on the busy road
N13	08.12.2020	Yes	No	No reason provided
N3	09.12.2020	Yes	No	This noise monitor is located on the busy road
N4	09.12.2020	Yes	Yes	This noise monitor is located on the busy road
N3	10.12.2020	Yes	No	This noise monitor is located on the busy road
N4	10.12.2020	Yes	No	This noise monitor is located on the busy road
N3	11.12.2020	Yes	No	This noise monitor is located on the busy road
N4	11.12.2020	Yes	Yes	This noise monitor is located on the busy road
N3	12.12.2020	Yes	No	This noise monitor is located on the busy road
N4	13.12.2020	Yes	No	This noise monitor is located on the busy road
N3	14.12.2020	Yes	No	This noise monitor is located on the busy road
N3	15.12.2020	Yes	Yes	This noise monitor is located on the busy road
N3	16.12.2020	Yes	No	This noise monitor is located on the busy road
N3	17.12.2020	Yes	No	This noise monitor is located on the busy road
N3	18.12.2020	Yes	No	This noise monitor is located on the busy road
N4	18.12.2020	Yes	No	This noise monitor is located on the busy road
N3	19.12.2020	Yes	No	This noise monitor is located on the busy road
N3	21.12.2020	Yes	No	This noise monitor is located on the busy road
N3	22.12.2020	Yes	No	This noise monitor is located on the busy road
N3	22.12.2020	Yes	No	This noise monitor is located on the busy road

N4	23.12.2020	Yes	Yes	This noise monitor is located on the busy road
N3	24.12.2020	Yes	No	This noise monitor is located on the busy road
N4	24.12.2020	Yes	No	This noise monitor is located on the busy road
N3	27.12.2020	Yes	No	This noise monitor is located on the busy road
N3	28.12.2020	Yes	No	This noise monitor is located on the busy road
N4	28.12.2020	Yes	No	This noise monitor is located on the busy road
N3	30.12.2020	Yes	No	This noise monitor is located on the busy road
N3	31.12.2020	Yes	No	This noise monitor is located on the busy road
N4	31.12.2020	Yes	No	This noise monitor is located on the busy road
N3	01.01.2021	Yes	No	This noise monitor is located on the busy road
N3	02.01.2021	Yes	No	This noise monitor is located on the busy road
N4	02.01.2021	Yes	No	This noise monitor is located on the busy road
N3	03.01.2021	Yes	No	This noise monitor is located on the busy road