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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: 04rd January – 01st March

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:

- 2 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

- Vibration readings recorded vibrations above the limit specified within the Project EIS on 19.01.2021. Cause: rust falling on monitor.

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)

- Vibration readings recorded vibrations above the limit specified within the Project EIS on the following days:
- 04.02.2021. Cause: rust falling on monitor
- 10.02.2021. Cause: This breach was caused by accidental knock to monitor by homeowner.
- 21.02.2021. Cause: This breach was caused by accidental knock to monitor. Although there were pilling works on going nearby, the two nearest monitors to the works were not set off.

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.

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)

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

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)

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

Monitor 14 (South Circular Road)

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

Monitor	Date	DCC 10hr limit breech	Reason for breech
N3	04.02		This noise monitor is located close to a busy road.
N14	04.02	Yes	This noise monitor is located close to a busy road.
N3	05.01		This noise monitor is located close to a busy road.
N14	05.01	Yes	This noise monitor is located close to a busy road.
N3	06.01		This noise monitor is located close to a busy road.
N4	06.01		This noise monitor is located close to a busy road.
N3	07.01		This noise monitor is located close to a busy road.
N4	07.01		This noise monitor is located close to a busy road.
N14	07.01		This noise monitor is located close to a busy road.
N3	08.01		This noise monitor is located close to a busy road.
N4	08.01		This noise monitor is located close to a busy road.
N14	08.01		This noise monitor is located close to a busy road.
N14	09.01	Yes	This noise monitor is located close to a busy road.
N3	10.01		This noise monitor is located close to a busy road.
N4	10.01		This noise monitor is located close to a busy road.
N3	11.01		This noise monitor is located close to a busy road.

N14	11.01		This noise monitor is located close to a busy road.
N3	12.01		This noise monitor is located close to a busy road.
N14	12.01		This noise monitor is located close to a busy road.
N3	13.01		This noise monitor is located close to a busy road.
N14	13.01		This noise monitor is located close to a busy road.
N3	14.01		This noise monitor is located close to a busy road.
N4	14.01		This noise monitor is located close to a busy road.
N13	14.01		This monitor is located at a close proximity to the busy South Circular Road. This monitor is constantly exceeding the limits outside of construction hours indicating that these breaches are due to ambient traffic.
N3	15.01		This noise monitor is located close to a busy road.
N4	15.01		This noise monitor is located close to a busy road.
N14	15.01		This noise monitor is located close to a busy road.
N3	16.01		This noise monitor is located close to a busy road.
N4	16.01		This noise monitor is located close to a busy road.
N14	16.01		This noise monitor is located close to a busy road.
N3	18.01		This noise monitor is located close to a busy road.
N4	18.01		This noise monitor is located close to a busy road.
N3	19.01		This noise monitor is located close to a busy road.
N4	19.01		This noise monitor is located close to a busy road.
N5	19.01		The sounds recorded on the nearest recording location (64ORA) indicate that these exceedances are caused by some consaw noises associated with works on going on the pile wall.
N14	19.01		This noise monitor is located close to a busy road.
N3	20.01		This noise monitor is located close to a busy road.
N4	20.01		This noise monitor is located close to a busy road.
N5	20.01		Drilling on going near by.
N3	21.01		This noise monitor is located close to a busy road.
N4	21.01		This noise monitor is located close to a busy road.
N3	22.01		This noise monitor is located close to a busy road.
N4	22.01		This noise monitor is located close to a busy road.
N3	23.01		This noise monitor is located close to a busy road.
N4	23.01		This noise monitor is located close to a busy road.
N3	24.01		This noise monitor is located close to a busy road.
N4	24.01		This noise monitor is located close to a busy road.
N3	25.01		This noise monitor is located close to a busy road.
N4	25.01		This noise monitor is located close to a busy road.
N3	26.01		This noise monitor is located close to a busy road.
N4	26.01		This noise monitor is located close to a busy road.
N3	27.01		This noise monitor is located close to a busy road.
N4	27.01		This noise monitor is located close to a busy road.
N3	28.01		This noise monitor is located close to a busy road.
N4	28.01		This noise monitor is located close to a busy road.
N13	28.01		This noise monitor is located close to a busy road.
N3	29.01		This noise monitor is located close to a busy road.

N4	29.01		This noise monitor is located close to a busy road.
N3	30.01		This noise monitor is located close to a busy road.
N4	30.01		This noise monitor is located close to a busy road.
N3	31.01		This noise monitor is located close to a busy road.
N4	31.01		This noise monitor is located close to a busy road.
N3	01.02		This noise monitor is located close to a busy road.
N4	01.02		This noise monitor is located close to a busy road.
N3	02.02		This noise monitor is located close to a busy road.
N4	02.02		This noise monitor is located close to a busy road.
N3	03.02		This noise monitor is located close to a busy road.
N4	03.02		This noise monitor is located close to a busy road.
N3	04.02		This noise monitor is located close to a busy road.
N4	04.02		This noise monitor is located close to a busy road.
N3	05.02		This noise monitor is located close to a busy road.
N4	05.02		This noise monitor is located close to a busy road.
N3	06.02		This noise monitor is located close to a busy road.
N4	06.02		This noise monitor is located close to a busy road.
N4	07.02	Yes	This noise monitor is located close to a busy road.
N3	08.02		This noise monitor is located close to a busy road.
N4	08.02		This noise monitor is located close to a busy road.
N3	09.02		This noise monitor is located close to a busy road.
N4	09.02		This noise monitor is located close to a busy road.
N3	10.02		This noise monitor is located close to a busy road.
N3	11.02		This noise monitor is located close to a busy road.
N4	11.02		This noise monitor is located close to a busy road.
N14	11.02		This noise monitor is located close to a busy road.
N3	12.02		This noise monitor is located close to a busy road.
N4	12.02		This noise monitor is located close to a busy road.
N14	12.02		This noise monitor is located close to a busy road.
N3	13.02		This noise monitor is located close to a busy road.
N4	13.02	Yes	This noise monitor is located close to a busy road.
N14	13.02		This noise monitor is located close to a busy road.
N3	14.02		This noise monitor is located close to a busy road.
N4	14.02		This noise monitor is located close to a busy road.
N14	14.02		This noise monitor is located close to a busy road.
N3	15.02		This noise monitor is located close to a busy road.
N4	15.02		This noise monitor is located close to a busy road.
N14	15.01		This noise monitor is located close to a busy road.
N3	16.02		This noise monitor is located close to a busy road.
N4	16.02		This noise monitor is located close to a busy road.
N14	16.02		This noise monitor is located close to a busy road.
N3	17.02		This noise monitor is located close to a busy road.
N4	17.02		This noise monitor is located close to a busy road.
N14	17.02		This noise monitor is located close to a busy road.
N3	18.02		This noise monitor is located close to a busy road.

N4	18.02		This noise monitor is located close to a busy road.
N3	19.02		This noise monitor is located close to a busy road.
N4	19.02		This noise monitor is located close to a busy road.
N14	19.02		This noise monitor is located close to a busy road.
N4	20.02		This noise monitor is located close to a busy road.
N14	20.02		This noise monitor is located close to a busy road.
N3	21.02		This noise monitor is located close to a busy road.
N4	21.02		This noise monitor is located close to a busy road.
N14	21.02		This noise monitor is located close to a busy road.
N3	22.02		This noise monitor is located close to a busy road.
N4	22.02		This noise monitor is located close to a busy road.
N14	22.02		This noise monitor is located close to a busy road.
N3	23.02		This noise monitor is located close to a busy road.
N4	23.02		This noise monitor is located close to a busy road.
N14	23.02		This noise monitor is located close to a busy road.
N3	24.02		This noise monitor is located close to a busy road.
N4	24.02		This noise monitor is located close to a busy road.
N3	25.02		This noise monitor is located close to a busy road.
N4	25.02		This noise monitor is located close to a busy road.
N3	26.02		This noise monitor is located close to a busy road.
N4	26.02		This noise monitor is located close to a busy road.
N4	27.02		This noise monitor is located close to a busy road.
N3	28.02		This noise monitor is located close to a busy road.
N4	28.02		This noise monitor is located close to a busy road.