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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: 25th March 2019 – 21st April 2019

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 particular features of adjacent properties require it.

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

- Steel and excavation work at O'Reilly Avenue/Energy Centre.
- Concrete pouring, steel works and excavation of materials at the hospital entrance.
- Pouring concrete, basement construction and excavation works near Cameron Square.
- Construction of basement level and excavation works near South Circular Road.
- Pouring concrete and excavation near Mount Brown.
- Excavation works and depositing material near Brookfield Clinic.

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 (25th March 2019 – 21st April 2019) 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 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.

Memo

Location of Noise 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. The majority of vibration readings during the monitoring period recorded readings below the limit specified within the Project EIS. Vibration monitors V1, V13, V18, 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:

- 1 number monitors recorded readings above the limit specified within the Project EIS.
- 1 number monitors were offline for portions of the monitoring period and are noted below.

Detailed Summary:

Sensor (V2 – 3835) (James' Walk)

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

Sensor (V3 – 8838) (South Circular Road)

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

Sensor (V5 – 9155) (Cameron Square)

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

Sensor (V6 - 9736) (Cameron Square)

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

Sensor (V7 - 9734) (Old Kilmainham Road)

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

Memo

Sensor (V8 - 3485) (Brookfield Clinic)

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

Sensor (V9 – 8995) (O'Reilly Avenue)

- Vibrations above the limit specified within the project EIS were recorded on the following dates: 30th March 2019 & 2nd, 6th April 2019.
- The vibration report states the cause of these readings was "*accidental knocks*":
- The monitor was offline on the following dates: 25th, 26th, 27th, 28th, 29th 30th & 31st March 2019 and 1st, 2nd, 3rd, 4th, 5tf 65th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th & 21st April 2019.

Sensor (V10 – 4183) (O'Reilly Avenue)

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

Sensor (V11 – 8983) (O'Reilly Avenue)

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

Sensor (V12 – 3252) (O'Reilly Avenue)

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

Sensor (V14 - 9737) (Mount Shannon)

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

Memo

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 (25th March 2019 – 21st April 2019) summarised for this report there were up to 16 active monitors at the site boundaries.

Observations:

Executive Summary:

Noise monitors 07, 08, 15 & 16 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:

- 7 number monitors recorded readings above the limit specified within the Project EIS.
- 1 number monitors were offline for portions of the monitoring period and are noted below.

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)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 25th, 26th, 27th, 28th & 29th March 2019 and 1st, 3rd, 5th, 8th, 9th, 10th, 12th, 13th, 15th, 16 & 17th April 2019.
- The noise report states the cause of these readings were: *"concrete pouring", "moving rebar".*

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 recorded on the following dates: 11th, 15th and 17th of April 2019.
- The noise report states the cause of these readings was *"ambient traffic noise".*

Memo

Monitor 04 (Mount Brown Road)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 25th, 26th, 27th, 28th, 29th, 30th & 31st March 2019 and 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 16th, 17th, 18th, 19th 20th & 21st April 2019.
- The noise report states the cause of these readings was *"ambient traffic noise".*

Monitor 05 (O'Reilly Avenue)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 4th & 15th April.
- The noise report states the cause of these readings was noise from a "tracked excavator" and a "consaw"."
- The monitor was offline on the following dates: 25th, 26th, 27th, 28th & 29th March 2019.

Monitor 06 (O'Reilly Avenue)

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

Monitor 09 (86 James' Walk)

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

Monitor 10 (Brookfield Clinic)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 15th, 16th and 17th April 2019.
- The noise report states the cause of these readings was noise *"due to the abundance of concrete trucks passing by the monitor."*

Monitor 11 (Cameron Square)

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

Monitor 12 (Cameron Square)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 25th, 26th & 29th March 2019 and 1st, 8th, 9th, 10th, 11th, 12th, 13th, 15th, 16th, 17th & 18th April 2019.
- The noise report states the cause of these readings was *"due to COD and JW Casey's completing foul and storm drainage works at basement level"* and *"concrete being broken out and drilling being completed".*

Monitor 13 (O'Reilly Avenue)

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

Monitor 14 (Mount Shannon Road)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 25th, 26th, 27th, 28th, 29th, 30th & 31st March 2019 and 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 16th, 17th, 18th, 19th 20th & 21st April 2019.
- The noise report states the cause of these readings was *"ambient traffic noise".*