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Project: National Paediatric Hospital

Report Type: Summary of Noise Vibration & Movement Monitoring Results

Period of Monitoring: 30th August 2021 – 4th October 2021

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 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 FM Tunnel, Loading Bay, Deliveries, Waste skip removal. Façade works. Teleporters operational.

Hospital – Interior works. Deliveries, Construction traffic, Breaking of temporary wall, loading bay area, waste removal. HGV traffic. Façade works.

Cameron Square – No works listed in the Environmental Monitoring Report.

South Circular Road – Interior works. HGV Loading bay. Façade stone works. Gate four operational. Scaffold loading.

Mount Brown – Waste removal, deliveries and ground works. Shuttering for liner wall.

Brookfield Clinic – Lift of steel beam stored in the area, Material drop-off.

Energy Centre – Steel fixing, waste removal, rebar and steel fixing, ground works. Deliveries, movement and storage of materials. Area clean up. Teleporters operational. Façade work at north of Meadow garden.

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.

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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

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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:

- No monitor recorded readings above the limit specified within the Project EIS.
- No monitors were offline during the timeframe covered in this report.

Detailed Summary:

Sensor (V2 – 3666) (James' Walk)

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

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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)

- 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:

- 6 number monitors recorded readings above the limit specified within the Project EIS.
- 0 number monitors were offline for at least 1 day during the timeframe covered by this report.

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.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 02 (O'Reilly Avenue)

- All noise readings recorded noise levels below the limit specified within the Project EIS.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 03 (Mace)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 30th and 31st August 2021, 1st, 2nd, 3rd, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 13th, 14th, 15th, 16th, 17th, 18th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th and 30th September 2021 and 1st, 2nd, 3rd and 4th October 2021. The noise report stated "The monitor is located close

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to the busy SC road and MACE shop. Exceedances are due to traffic and can often be seen out of construction hours.”

- Exceedances were noted mostly between 8AM and 6PM on weekdays but are also noted on the afternoon on the weekends.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 04 (Mount Brown Road)

- Noise levels above the limit specified within the Project EIS were recorded on every day between the 30th August 2021 to the 3rd October 2021.
- The noise report stated “This monitor is located over the busy R810 road. The monitor is constantly in breach due to its close proximity to the road. We often see breaches outside of construction hours therefore these breaches are deemed to be due to ambient traffic noise.”
- Exceedances were noted between 6AM and 11PM, 7 days a week.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 05 (O’Reilly Avenue)

- All noise readings recorded noise levels below the limit specified within the Project EIS.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 06 (O’Reilly Avenue)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 8th and 28th September 2021. The exceedance on the 8th was noted between 6AM and 7AM which was noted as “outside of construction hours”. Regarding the exceedance on the 28th, the noise report stated “Breach caused by a single spike - upon investigation found no excessive construction work taking place in the area. It is presumed this breach was caused by non-construction activity.”
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 09 (James’ Walk)

- All noise readings recorded noise levels below the limit specified within the Project EIS.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 10 (Brookfield Clinic)

- All noise readings recorded noise levels below the limit specified within the Project EIS.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

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Monitor 11 (Cameron Square)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 23rd September 2021. The noise report stated: “the breaches took place out of construction hours.” [After 10PM]”
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 12 (Cameron Square)

- All noise readings recorded noise levels below the limit specified within the Project EIS.
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 13 (64 O’Reilly Avenue)

- Noise levels above the limit specified within the Project EIS were recorded on the following dates: 15th, 18th, 22nd, 24th and 27th September 2021. The noise report stated: “[These] breach took place out of construction hours.” [After 7PM] “
- All noise readings recorded noise levels below the limit specified within the DCC 10-hour limit.

Monitor 14 (South Circular Road)

- Noise levels above the limit specified within the Project EIS were recorded on every day between the 30th August 2021 to the 3rd October 2021.
- The noise report stated “This noise monitor is located on the busy South Circular Road. The monitor is often in breach, inclusive of outside of construction hours such as on this date, therefore these breaches are deemed to be due to ambient traffic noise.”
- Exceedances were noted between 6AM and 11PM, 7 days a week.
- Noise levels above the limit specified within the DCC 10-hour limit were noted on the following days:
 - 2nd September 2021: The noise value noted is 84.9 dB. The noise report states the cause as “ambient noise”. No mitigation is noted. NCH clarified to Atkins that, at the time of the breaches which lead to the 10-hour average, a representative went to investigate and noted no evidence of construction noise.
 - 27th September 2021: The noise value noted is 78.3 dB. The noise report states the cause as “Road works commenced directly beneath the monitor on Mount Shannon Rd with heavy machinery operational to tar road surface.”. No mitigation is noted.
 - 30th September 2021: The noise value noted is 75.4 dB. The noise report states the cause as “Additional noise unrelated to NCH site could be heard in the vicinity on this date.”. No mitigation is noted.