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ATKINS

Project: National Paediatric Hospital

Report Type: Summary of Noise and Vibration Monitoring Results

Period of Monitoring: Sensor data 11th December – 20th December 2017

Introduction

Contained within the project documents for the National Paediatric 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.

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

Memo

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 (11th December – 20th December 2017) there were up to 13 active vibration monitors installed at the perimeter of the site.

Location of Vibration and Noise Monitors:

The new layout of the monitors is as seen below:

Location of Vibration Monitors

Sensor 9737 has been moved from O'Reilly Avenue to Mount Shannon Road. Sensor 9151 has been replaced by sensor 9000 but it is still on the South Circular Road. Sensor 9005 has been replaced with sensor 9028 but it is still in Cameron Square.

There were 12 active vibration monitors on site in November 2017. One additional monitor was added for December to the rear of O'Reilly Avenue.

Memo

Location of Vibration Monitors around O'Reilly Avenue

Observations:

Executive Summary:

The majority of vibration readings recorded below the limit specified within the Project EIS. However three number monitors recorded readings above the limit specified within the Project EIS. These triggers were generally caused by residents knocking into the sensors. Vibration monitors have been placed at the 'closest part of the sensitive properties' as per the EIS where this is feasible.

Detailed Summary:

Sensor (9000) (South Circular Road)

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

Sensor (9244) (O'Reilly Avenue)

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

Sensor (8681) (Mount Brown)

- There were 1 number vibration reading recorded above the limit specified within the Project EIS. This reading was recorded on the 19th December. The reading appears to be an isolated incident with the readings either side of the peak within the specified limit. The report indicates that *"This breach was caused by the construction of the piling platform. The engineer talked to the crew about the noise and vibration limitations and instructed to use a roller at a lower speed to limit vibrations".*

Sensor (9141) (Hospital A&E)

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

Sensor (9028) (Cameron Square)

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

Sensor (8898) (O'Reilly Avenue)

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

Sensor (8939) (Cameron Square)

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

Sensor (8995) (O'Reilly Avenue)

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

Sensor (8983) (O'Reilly Avenue)

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

Sensor (9737) (4 Mount Shannon Road)

- There were 1 number vibration reading recorded above the limit specified within the Project EIS. This reading was recorded on the 12th December. This single trigger is much larger than all other readings over the duration of the monitoring period. The magnitude and pattern of the reading is indicative of the vibration monitor being physically moved or hit rather than a record of vibration transmitted through the ground to the sensor by construction works. The report indicates that *"This breach occurred by the resident of the property knocking the instrument when taking the bins out".*

Sensor (9750) (Rialto Luas)

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

Sensor (9734) (Hospital Entrance)

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

Sensor (9736) (Cameron Square)

- There was 1 number vibration reading recorded above the limit specified within the Project EIS. This reading was recorded on the 13th December. The monitoring report highlights that there was no heavy construction works taking place in the area at the time of the trigger and following the trigger the surveyor did a remote visual check of the monitor. It was seen that the monitor is fixed to the wall immediately adjacent to the rear door of the property and the door was open. The surveyor suspected that the trigger may not be construction related and that the monitor may have been bumped or activated by a swinging / banging door. The vibration trigger read 5.34mm/s which is above the lowest limit set for sensitive structures but below the limit of 15mm/s for soundly constructed buildings.

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 (11th December – 20th December 2017) summarised for this report there were up to 13 active monitors at the site boundaries.

Observations:

Executive Summary:

Five of the thirteen monitors recorded noise levels above the limits set out in the Project EIS, these are 01, 03, 04, 08 and 09.

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 Monitor 01 recorded levels above those set out in the Project EIS on 5 separate days (11th, 12th, 13th, 16th & 18th Dec) with typical values between 70-73 dB LA_{eq1hr} and a maximum of 79 dB LA_{eq1hr}.
- The report indicates that *"This breach occurred due to the demolition works at the private clinic".*

Monitor 02 (O'Reilly Avenue)

- Noise Monitor 02 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.

Monitor 03 (South Circular Road)

- Noise Monitor 03 recorded levels above those set out in the Project EIS on 1 occasion, 11th Dec. The magnitude of the reading was 73 dB LA_{eq1hr}. The readings either side of the triggers are below the limits specified in the Project EIS suggesting that the triggers are being reacted to. Site activities on this day included excavation of material at hospital/South Circular Road.

Monitor 04 (Mount Brown Road)

- Noise Monitor 04 is located at Mount Brown and is exposed to high levels of ambient noise caused by traffic. The levels recorded were mostly between 70-75 dB LA_{eq1hr}. The readings didn't exceed 80 dB LA_{eq1hr} in the timeframe covered in this report.

Monitor 05 (O'Reilly Avenue)

- Noise Monitor 05 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.
- The monitor was offline on the 11th & 12th December.

Monitor 06 (O'Reilly Avenue)

- Monitor 6 has no data available for the period covered in this report. However monitor 6 is in close proximity to monitor 5 & 13 so these monitors should indicate what was happening in this area of the site. Monitors 5 and 13 did not record any triggers above the limit set in the Project EIS.

Monitor 07 (Hospital A&E)

- Noise Monitor 07 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.
- The monitor was offline on the 13th, 16th, 17th, & 20th December 2017.

Monitor 08 (Pharmacy)

- Noise Monitor 08 is adjacent to the St James Hospital site and recorded levels above those set out in the Project EIS on the following dates: December 12th, 14th, 15th, 16th, 18th, 19th & 20th 2017. The peak reading, on 18th December 2017 was 83 dB LA_{eq1hr}.
- The monitoring report indicates that construction activity on site was only taking place in this area on 14th, 15th and 20th December. The peak values during days where construction was taking place was 78 dB LA_{eq1hr}. It is reported that deliveries to and waste removal from St James take place in this area with these deliveries causing the remaining triggers.
- The monitor was offline on the 13th December 2017.

Monitor 09 (Rialto LUAS)

- Noise Monitor 09 recorded levels above those set out in the Project EIS on 2 separate days (18th and 20th December 2017). It is reported that the triggers can be attributed to ambient noise associated with the LUAS. Construction works in this area at the time of the triggers included work on the sewer for the new compound at the pharmacy.
- The monitor was offline between the 12th and the 17th December inclusive.

Monitor 10 (Brookfield Clinic)

- Noise Monitor 10 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.

Monitor 11 (Cameron Square)

- Noise Monitor 11 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.
- The monitor was offline on the 13th & 19th December.

Monitor 12 (Cameron Square)

- Noise Monitor 12 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.
- The monitor was offline on the 12th to 17th December inclusive.

Monitor 13 (O'Reilly Avenue)

- Noise Monitor 13 recorded levels below those set out in the Project EIS for the duration of the timeframe covered in this report.