

of an
evidence

**IN THE MATTER OF AN APPLICATION TO
AN BORD PLEANÁLA
FOR PERMISSION FOR
STRATEGIC INFRASTRUCTURE
DEVELOPMENT
(THE CHILDREN'S HOSPITAL OF
IRELAND)**

ABP Reg. No. PL29N.PA0024

AND IN THE MATTER OF AN ORAL HEARING

**Statement of Evidence of Dr Stephen Smyth on the
topic of Noise & Vibration**

1. Qualifications and Experience

My name is Dr Stephen Smyth. I hold a degree (BAI) in mechanical engineering from Trinity College Dublin (2003) as well as a PhD in the field of acoustics also from Trinity College Dublin (2007).

I am currently an Acoustic Consultant with AWN Consulting. In this role I am responsible for assessing the noise and vibration impact of a variety of developments. My experience includes the following projects.

- D4 Hotels (former Jurys Ballsbridge) redevelopment
- M11 Enniscorthy Bypass road scheme
- N5 Westport to Turlough road scheme
- N17 Tuam to Claremorris road scheme; and
- M7/M8 Portlaoise to Cullahill/Castletown road scheme.

2. Role in Proposed Development

I am directly responsible for the following areas of the project, and the preparation of the corresponding sections of the Environmental Impact Statement [EIS]:

- Volume 2 Chapter 10 Noise & Vibration.

3. Key Issues in relation to Noise & Vibration

3.1. INTRODUCTION

Chapter 10 of Volume 2 of the EIS sets out the likely noise and vibration impact of the proposed development of the Children's Hospital of Ireland at the Mater Hospital Campus.

When considering a development of this nature the noise and vibration impacts of the following phases of the development are considered:

- Temporary impacts of the construction phase; and
- Long term impacts of the operational phase.

3.2. DESCRIPTION OF EXISTING ENVIRONMENT

Baseline assessment¹

The existing noise and vibration climate has been surveyed during both the daytime and night-time periods and has been found to be typical of an urban area. Prevailing noise levels are primarily due to road traffic noise. No source of vibration was subjectively noticeable and the baseline vibration levels are also typical of an urban location where road traffic and pedestrian movements contribute to low baseline vibration levels.

3.3. POTENTIAL IMPACTS ARISING FROM THE PROPOSED DEVELOPMENT

3.3.1 Construction Phase Potential Impacts

Construction Noise Impact²

As stated in Section 10.4.4 of Volume 2 of the EIS, there is the potential for a noise impact to occur during the construction of the development. In particular the demolition, piling and excavation phases of the construction works have the greatest potential to generate a noise impact. Furthermore, construction vehicles accessing the site can also generate a noise impact on the surrounding properties.

Construction Vibration Impact³

Section 10.4.4 of Volume 2 of the EIS also discusses the potential vibration impact of the construction phase. The main source of vibration during construction will be the piling process.

3.3.2 Operational Phase Potential Impacts

Noise Emissions⁴

Section 10.4.5 of Volume 2 of the EIS discusses the noise impact of the development during its operational phase. During the operational phase, potential causes of disturbance are considered to be limited to building services plant, additional vehicles on the existing road system, car parking activity, emergency dispatch services and waste/service yard activities.

¹ Section 10.2, Volume 2, EIS.

² Section 10.4.4, Volume 2, EIS.

³ Section 10.4.4, Volume 2, EIS.

⁴ Section 10.4.5, Volume 2, EIS.

Vibration Emissions

There will be no source of vibration associated with the operational phase of the development.

3.4. MITIGATION MEASURES PROPOSED

3.4.1 Construction Phase

The detailed noise assessment of the worst-case scenario during the construction phase of the project has found there will be some temporary impact on the nearest noise sensitive locations due to noise emissions from the site. However, the noise emissions will be controlled to be within acceptable standards once the following mitigation measures are in place:

- a 8m high noise barrier is erected around the north, east and west boundaries of the construction site;
- a 3m high solid hoarding is erected along the Eccles Street side of the site;
- low noise construction methods are implemented, e.g. bored piling and non-percussive demolition;
- limiting inclines on haul roads to be no greater than 15%;
- application of binding hours of operation;
- no night-time works;
- continuous noise & vibration monitoring; and
- the use of localised screens to further reduce the noise impact of static plant.

In order to ensure that the above mentioned mitigation measures are effectively implemented these measures will be required to be included in the Construction Management Plan which will be prepared by the appointed contractor and agreed with Dublin City Council prior to commencement of the construction.

3.4.2 Operational Phase

The noise impact assessment of the operational phase has found that the impact associated with the development will not be significant following the implementation of the following mitigation measures:

- noise attenuation to building services plant; and
- a policy of “no sirens” for emergency vehicles unless necessary when on site.

3.5. PREDICTED RESIDUAL IMPACTS (i.e., POST-MITIGATION)

3.5.1 Construction Phase Impacts

As set out in Section 10.4.4 of Volume 2 of the EIS, the worst-case noise impact during the construction phase of the development will be:

A worst-case external noise level of 65dB $L_{Aeq,1hr}$ during the construction phase at the nearest residential locations (see Table 10.20 in Chapter 10, Volume 2, EIS). This is based on the scenario where construction activity is in operation on the area of the site closest to the residential properties and where the mitigation measures of low noise equipment and localised screens are not included. This also represents the noise impact at the closest residential property and the noise impact on those properties further away will be lower.

For the majority of the time the predicted internal construction noise levels within the adjacent hospital buildings are within the internal noise criterion of 45dB $L_{Aeq,1hr}$. At certain locations and for some construction activities the internal noise level is predicted to be up to 50dB $L_{Aeq,1hr}$. This level will be audible, however, the levels are not considered to be intrusive. It should also be noted that this is a worst-case assessment and that the mitigation measures discussed previously will help to further reduce the noise impact in these areas.

3.5.2 Operational Phase Impacts

During the operational phase of the development any additional noise or vibration impact associated with the new development will be small and not significant.

4. Submissions and Responses

The following persons made submissions or responses to the Board in relation to the issues of noise and vibration:

- Dublin City Council;
- Nuala Morris;
- Mater Private Hospital;
- Mary Gallagher;
- Rita White;
- Terry Mallin;
- Patricia Fennelly;
- BLEND Residents Association;
- Clare Fallon;
- Grangegorman Residents Alliance;
- Patricia O'Conner & Frank D'Easaille;
- An Taisce;
- Berkely Environmental Awareness Group;
- Donnchadh O'Riordain;
- Paschal Donohoe; and
- Robert M. Foley & Associates.

Given that certain of the persons who made submissions dealt with similar issues, I propose to deal with those issues in turn.

4.1. Issue – Reference to the Noise Impact of a Helipad

Submission:

A number of submissions⁵ raise concern over the noise impact of a helipad.

Response:

As there is no helipad as part of the application submitted to the Board there is no helicopter noise assessment necessary.

4.2. Issue – Reference to Increased Road Traffic Noise

Submission:

A number of submissions⁶ raise concern over the noise impact of the increased traffic volumes on the local road network as a result of the Children's Hospital development.

Response:

Section 10.4.5 of Volume 2 of the EIS addresses the noise impact of the increase in traffic volumes on the local road network in the vicinity of the development. The most affected roads in the area are Eccles St and the North Circular Road both of which experience an increase in noise level of less than 3dB. The other roads in the vicinity are shown to experience much lower noise level increases in the range of 0 to 2dB. These changes in noise level are typically imperceptible and therefore the associated impact is not significant.

4.3. Issue – Reference to a Construction Monitoring Committee

Submission:

A number of submissions⁷ have recommended that a Construction Monitoring Committee be established which includes members of the local community which would have responsibility for monitoring, including noise, during construction.

⁵ Submission dated 12 September 2011, received from Mary Gallagher, submission dated 13 September 2011, received from Terry Mallin, submission dated 12 September 2011, received from Patricia Fennelly and submission dated 14 September 2011 received from Patricia O'Connor and Frank D'Easaille

⁶ Submission dated 12 September 2011, received from Mary Gallagher, submission dated 13 September 2011, received from Terry Mallin and submission dated 12 September 2011, received from Patricia Fennelly

⁷ Submission dated 9 September 2011, received from Dublin City Council, submission dated 14 September 2011, received from the Berkely Environmental Awareness Group and submission dated 14 September 2011, received from Paschal Donohoe TD

Response:

It is intended that a Community Liaison Committee will be established prior to commencement of the development. Committee membership will include a number of members of the local community, as well as elected members of the Council, officials of the Council, and representatives of the developer. The committee will liaise with the appointed contractor who will be required to monitor noise and vibration during the construction phase of the project.

4.4. Issue – Reference to the Construction Noise Impact

Submission:

A number of submissions⁸ have raised concerns over the noise impact during construction.

Response:

With the application of binding hours of construction, which includes no night-time work, along with the inclusion of the 8m high noise barrier around the site and further measures such as low noise construction plant and localised screens the noise level at the nearest residential properties will be minimised. As a result of these measures the noise impact on the nearest residential properties during construction of the Children's Hospital is expected to be lower than that which was experienced during the construction of the Adult Hospital.

Furthermore, a noise control scheme will be developed as part of the Construction Management Plan, which will be submitted to Dublin City Council prior to commencement, in order to ensure that the noise impact on the surrounding environment is minimised.

4.5. Issue – Reference to the Noise Impact of Ambulance Movements

Submission:

The submission dated 13 September, received from Rita White, has raised concern over the noise from ambulance movements arriving at the hospital.

Response:

It will be the adopted policy of the Children's Hospital to direct ambulance and other emergency vehicles not to use sirens when on site unless absolutely necessary. This policy is based on the recommendation of the guidance document HTM 08-01 Acoustics. Following the adoption of this policy the noise from ambulance

⁸ Submission dated 12 September 2011, received from Nuala Morris, submission dated 13 September 2011, received from Clare Fallon and submission dated 14 September 2011, received from Paschal Donohoe TD

movements will be similar to that of other road traffic noise in the area and would not be expected to have a significant impact.

4.6. Issue – Reference to Residential Amenity

Submission:

A number of submissions⁹ have raised concerns over the impact on residential amenity as a result of the Children's Hospital development. While not mentioning noise as a specific issue it was considered appropriate to respond on the issue of any potential noise impact on residential amenity.

Response:

During the operational phase of the development, potential causes of noise impact are limited to building services plant, additional vehicles on the existing road network, car parking activity, emergency dispatch services and waste/service yard activities. It has been predicted that none of these will increase the existing noise climate sufficiently as to be a likely cause of disturbance. It is therefore concluded that the operational noise impact of the Children's Hospital will not impact on the residential amenity of nearby properties.

4.7. Issue – Reference to the Proposed Noise Conditions Recommended by Dublin City Council

Submission:

The submission dated 9 September, received from Dublin City Council, has recommended that the standard noise conditions typically applied by Dublin City Council be applied to the Children's Hospital development.

Response:

In relation to the standard noise conditions proposed by Dublin City Council we recommend that the condition be amended to be more specific to the proposed development. We recommend the following wording:

Noise Levels

- (a) During the construction and demolition phases, the proposed development shall comply with British Standard 5228 "Noise Control on construction and open sites Part 1. Code of practice for basic information and procedures for noise control."

⁹ Submission dated 13 September 2011, received from BLEND, submission dated 12 September from the Grangegorman Residents Alliance, submission dated 14 September received from An Taisce and submission dated 14 September 2011, received from Donnchadh O'Riordain

- (b) During the operational phase, the external façade noise level at residential properties from all fixed plant installation associated with the development, including electrical equipment, shall not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance. In particular, the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in B.S. 4142. Method for rating industrial noise affecting mixed residential and industrial areas.
- (c) The combined external façade noise level at residential properties from other sources located within the development (excluding emergency dispatch vehicles) should not exceed 50dB $L_{Aeq,1hr}$ during the daytime (07:00hrs to 23:00hrs) and 45dB $L_{Aeq,5min}$ during the night-time (23:00hrs to 07:00hrs).
- (d) Before the use hereby permitted commences, a scheme shall be submitted to and approved in writing, by the planning authority for the effective control of noise from the premises. The scheme shall be implemented before the use commences and thereafter permanently maintained.

4.8. Issue – Reference to the Noise Impact on the Mater Private Hospital

Submission:

The submission dated 12 September, received from Tom Phillips on behalf of the Mater Private Hospital, has raised airborne noise, ground borne noise and vibration impacts on the Mater Private during the construction phase of the Children's Hospital as potential issues.

Response:

Detailed assessments of the airborne noise, ground borne noise and vibration impacts on the Mater Private during the construction phase have been carried out by Arup Acoustics and Rupert Taylor respectively. The noise and vibration criteria adopted in these reports have also been adopted as part of the EIS. Where issues have been identified mitigation measures have been adopted including the 8m high noise barrier, the use of low noise construction plant, localised screening and the co-ordination of activity most likely to cause impact at times where the sensitive equipment within the Mater Private is not in use. Furthermore, monitoring of noise and vibration levels at the most sensitive areas of the Mater Private will form part of the overall monitoring requirement of the development. The implementation of these measures will ensure that there is no appreciable impact on the Mater Private as a result of noise or vibration during construction.

4.9. Issue – Reference to the Vibration Impact on Protected Structures on Eccles Street

Submission:

The submission dated 13 September, received from Robert M. Foley & Associates, has raised concerns over the potential damage to the protected structures along Eccles St as a result of vibration from truck movements to the site.

Response:

It is not expected that the movement of trucks on Eccles Street would generate any significant levels of vibration. Furthermore, Section 10.4.2 of Volume 2 of the EIS discusses the appropriate vibration limits for the protected structures on Eccles Street. These vibration limits will be adopted by the contractor and have been chosen to avoid even cosmetic damage to these protected structures.

5. Conclusion

During the construction phase of the proposed development there will be some impact on nearby properties due to noise emissions from activity on site and truck movements to and from the site. However, the application of binding noise limits, hours of operation along with the implementation of appropriate noise and vibration mitigation measures, will ensure that the noise and vibration impact during construction will be kept to a minimum.

During the operational phase, potential causes of disturbance are considered to be limited to building services plant, additional vehicles on the existing road network, car parking activity, emergency dispatch services and waste/service yard activities. It has been predicted that none of these will increase the existing noise climate sufficiently so as to be a likely cause of disturbance.