
TECHNICAL NOTE

Project **City Block 2, Spencer Dock,
Dublin 1**

Subject **Noise Impact of Pumping Station**

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1.0 INTRODUCTION

This document assesses the noise and vibration impacts of the existing pumping station at Spencer Dock on the proposed development.

2.0 DESCRIPTION OF DEVELOPMENT

Development comprising of an alteration to permitted development Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at Spencer Place North, City Block 2, Spencer Dock, Dublin 1. The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to shared accommodation.

The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

Located on site is an existing Irish Water pumping station. This station is predominately located below ground with several small single-story buildings above ground. Figure 1 illustrates the pumping station in the context of the proposed development blocks.



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Figure 1 Site Layout

3.0 PUMPING STATION OPERATIONS

It is understood that the following plant items are installed in the pumping station:

- 8 No. pumps (a maximum of 6 in operation at any one time) located below ground;
- 4 No. odour control fans, and;
- backup generator.

The ventilation stack that is currently on site is to be incorporated into the design of Block 1 so that the existing flues are extended through a riser within the building to exhaust at roof level of Block 1, see Figure 2.

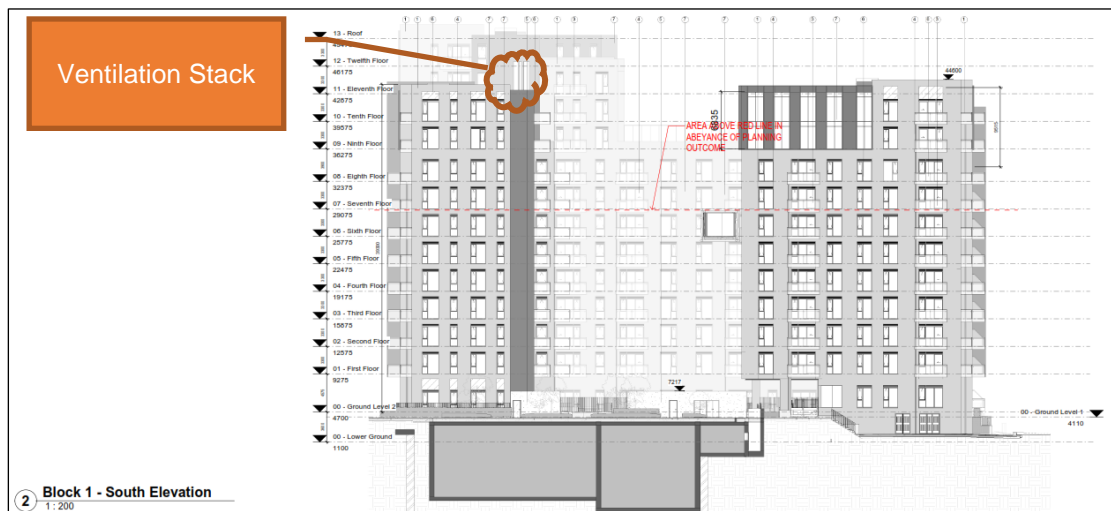


Figure 2 Ventilation Stack

A noise assessment previously conducted by AWN to inform the design of the pumping station determined the potential noise impact of the pumping station on the surrounding environment, including the previously planned residential development on the site in question. This assessment was based on a worst-case scenario, where the following plant items are operating simultaneously:

- 6 No. pumps;
- 4 No. odour control fans, and;
- backup generator.

In terms of noise emission, the pumps listed above are located at basement level and are fully enclosed from the environment by a concrete structure. As such the noise breakout from the pumps is not significant.

Therefore, the odour control fans and the backup generator are the only significant sources of noise in the context of impacts on the proposed development.

The backup generator will only operate in the event of a mains power failure or during testing, hence this item does not form part of standard operation from the pumping station. Testing of backup generators are only permitted during daytime periods. Whilst this type of source does not normally fall under normal operational noise criteria from a facility, in order to assess a worst-case analysis, noise levels associated with the back-up generator in addition to the continual plant items associated with pumps and odour control fans has been included in all calculations.

Noise breakout from the backup generator room assumes a concrete wall with louvres with 20% open area to permit air intake and discharge.

The assessment of the pumping station at design, when considering the worst-case impacts of the station operating at full capacity and running the backup generator found that the expected noise level at the nearest apartment within the development to be of the order of **31dB(A)**.

In this instance, noise levels associated with the pumping station includes noise from the standby generator, having regard for air intake as well as exhaust.

This was for an apartment at a distance of 15m from the pumping station. Comparing this to the current development shows that there are some apartment units of the order of 10m from the pumping station. Taking this into account would indicate that the noise level from the pumping station operation could be of the order of **35dB(A)**. This is a very low level of noise that would be mostly inaudible above the prevailing background noise in the environment.

The ventilation ductwork travels vertically on the external wall of Block 1 to the roof where it exhausts to the atmosphere. The ducts are concealed with external cladding and are only accessed from outside the building if required. Considering that this ductwork travels external to the building the risk of any noise impact on the occupants of Block 1 is low and no further mitigation is proposed. Figure 3 illustrates the ventilation ducts located outside the external wall of the building on a typical floor layout.

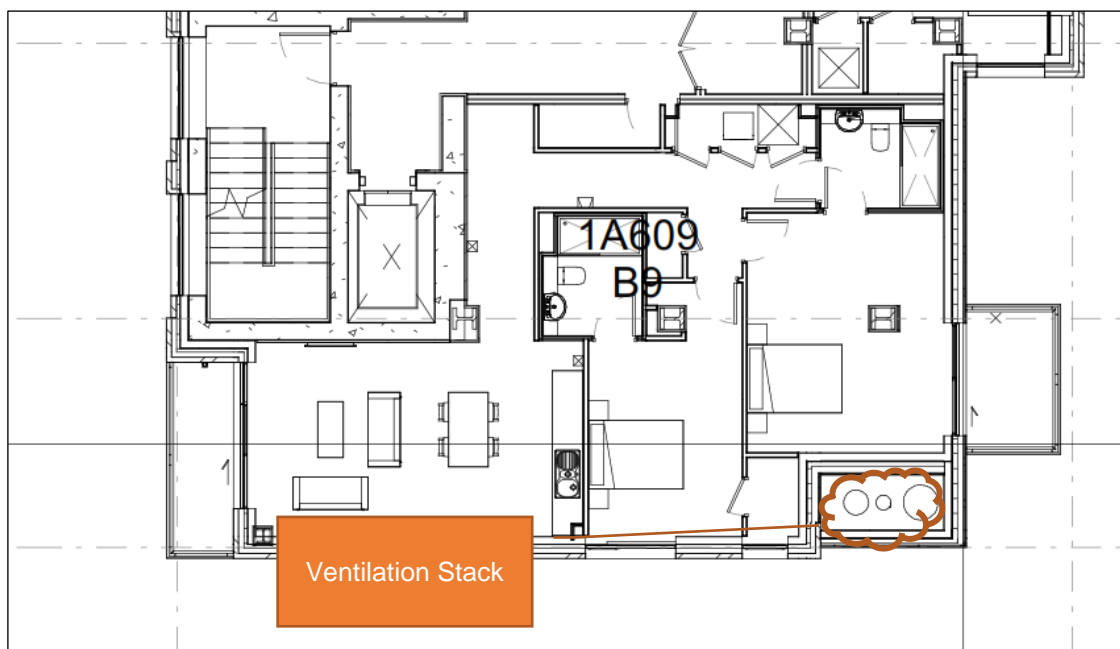


Figure 3 Ventilation Duct Location

In addition, it is considered appropriate to assess the noise impact of the ventilation exhaust at roof level on the apartments located on the top floor of Block 1. Taking into account attenuation due to distance and the shielding provided by the building itself the external noise level at the façade of the top floor of Block 1 is predicted to be 42dB L_{Aeq} . This level of noise is lower than that expected at the facades of the building as a result of road traffic and therefore the building façade will effectively mitigate noise transfer to internal spaces.

4.0 NOISE & VIBRATION SURVEY

All of the above is based on the pumping station operating during worst-case conditions when noise emissions are expected to be maximised. It is only possible to assess the future impacts via a desktop exercise, however, the current day to day operations of the pumping station have been assessed via measurement on-site.

Note that the pumping station as constructed on site includes ventilation stacks that exhaust approximately 5m above ground, see Figure 4.

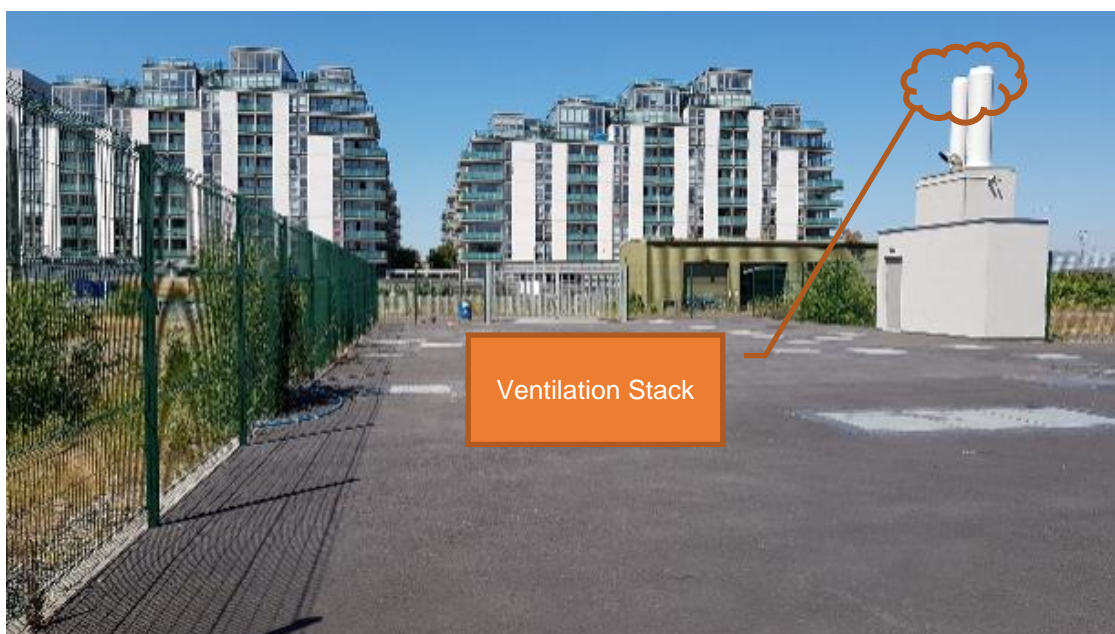


Figure 4 Existing Ventilation Stack

Noise measurements were taken at various points around the perimeter of the pumping station and vibration readings were taken immediately adjacent to the pumping station enclosure to determine the existing levels of vibration.

Measurements were conducted between 11:00hrs and 12:00hrs on 28 June 2018 using a Brüel & Kjær Type 2260 Sound Level Meter and InstanTel Minimate vibration monitor. The weather during the daytime survey period was dry with a slight breeze of less than 1m/s. The temperature ranged from 20 to 24°C during this survey period.

The results of the survey found that in the majority of locations noise emissions from the pumping station were inaudible above other sources of noise in the environment (road traffic, construction, plant noise from other buildings). However, noise from the ventilation stack was measured at a distance of approximately 7m from the exhaust point. The noise level measured was of the order of 55dB at this location. Once this noise level is corrected to account for the future relocation of the exhaust point to the roof of Block 1 the noise level at the façade of the nearest apartment predicted in Section 3.0 is calculated to be of the order of the 42dB L_{Aeq} . To put this figure in context the baseline noise environment in the vicinity of the site, measured prior to the development of the pumping station, was found to be of the order of 45dB L_{A90} during the quietest night-time period. Therefore the noise generated by the ventilation stack is less than the pre-existing noise levels in the environment.

Vibration levels measured at the site of the pumping station were <0.1mm/s PPV which is considered to be imperceptible.

5.0 CONCLUSIONS

The potential noise impact of the existing pumping station at City Block 2, Spencer Dock, Dublin 1 on the proposed residential and shared living development on the site has been assessed.

Based on information previously provided to AWN relating to the pumping station design, calculations have been carried out to predict the noise levels associated with the proposed items of plant within the pumping station development.

In addition, an environmental noise survey has been carried out to assess the existing noise environment due to the operation of the pumping station.

Based on the results of the noise survey and calculations it is concluded that the noise levels from the existing pumping station are low and will not have a negative impact on the proposed development.

Finally, it has been determined through measurement, that the level of vibration in the ground due to the operation of the pumping station is low and is not expected to have any negative impacts on the proposed developments.