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By email: s 9(2)(a)

Dear Andrew,

Proposed fast-track application, 1 Selfs Road, Papatoetoe: Evaluation of noise and vibration effects

Acanthus Limited have engaged Styles Group Acoustics and Vibration Consultants to provide acoustic assessments to accompany the fast-track resource consent application for 1 Selfs Road, Papatoetoe (the Site). The application proposes to subdivide and develop the 3.46ha Site into residential housing.

This advice sets out our experience, scope of engagement on this project and confirms that we are able to provide recommendations to address the relevant acoustic criteria of the Auckland Unitary Plan (AUP).

Expertise

Styles Group Acoustics and Vibration Consultants provide specialist expertise across New Zealand in all aspects of environmental acoustics, including environmental noise, ground and structural vibration, underwater noise, and building, inter-tenancy and room acoustics.

We have extensive experience in the measurement, prediction, and assessment of noise effects on residential developments. We regularly undertake air and land traffic noise exposure assessments to determine compliance with criteria specifying an internal noise environment. We provide acoustic design recommendations to ensure dwellings provide an adequate level of acoustic amenity to residential occupants. We have completed a significant number of assignments subject to the AUP rules and standards for residential developments in aircraft noise overlays.

Styles Group are highly experienced in the preparation and review of applications subject to the AUP construction noise and vibration standards. These projects range from small-medium scale residential developments to large scale, multi-story, residential, commercial and mixed-use developments.

AUP criteria

The key acoustic criteria relevant to the assessment of the application are:

- Compliance with the controls relating to the establishment of Activities Sensitive to Aircraft Noise (**ASAN**) under Chapter D24 of the AUP;
- A construction noise and vibration assessment to determine compliance with the construction noise limits in E25.6.27 and the construction vibration limits in E25.6.30 of the AUP.

Aircraft noise overlay criteria

The Site is partly located within the “Moderate Aircraft Noise Area” (MANA) of Auckland Airport. The MANA applies to the area of land generally within the 60 – 65 dBA L_{dn} future aircraft noise contour of Auckland Airport. The balance of the Site is in the “Aircraft Noise Notification Area” (ANNA) of Auckland Airport. Figure 1 displays the air-noise contours across the Site.



Figure 1 Air-noise contours across the Site (outlined in turquoise) and the location of MANA and ANNA

Rule D24.6.3 of the AUP requires all buildings containing ASAN within (or partly within) the MANA to be designed and constructed to achieve an internal noise environment (in habitable rooms and sleeping areas) of 40 dBA L_{dn} . The internal noise level must be achieved with all external doors and windows closed. The rule also provides criteria for ventilation and/ or air conditioning system(s) to maintain fresh air supply and provide cooling to occupants.

Dwellings constructed within the MANA will need to be constructed to achieve a maximum noise level reduction of 25 dBA (65 dBA L_{dn} maximum predicted external noise level minus the 40 dBA L_{dn} internal design level). We have reviewed the proposed housing typologies and are satisfied that the extent of acoustic treatment to achieve the internal noise environment specified in rule D24.6.3(1) of the AUP will be straightforward. We note that most well-constructed modern buildings will achieve a noise level reduction of around 22-25 dB without any specific acoustic upgrades. We are confident that the criteria can easily be achieved through modest upgrades to façade and ceiling treatments.

The majority of the Site is located in the ANNA. Chapter D24 does not provide specific acoustic controls for ASAN within the ANNA, however we understand that the proposal requires consent as a restricted discretionary activity as the density of development will exceed one dwelling per 400m² (as set out in the activity table in D24 (A38)). The matters of discretion in D24.8.2.1 require an assessment of:

- (a) the objectives and policies relating to activities sensitive to aircraft noise;
- (b) the nature, size and scale of the proposed development;
- (c) measures for or relating to the attenuation of aircraft noise arising in connection with the airport; and
- (d) the imposition of an obligation to ensure any required acoustic treatment measures are not removed without the Council's consent, including requiring the obligation to be registered as a covenant on the certificate of title.

We will provide design recommendations to ensure the proposed dwellings within the ANNA are designed to achieve an internal noise level of 40dBA L_{dn} . This internal noise environment is consistent with the criteria for dwellings inside the MANA. As above, we anticipate that the internal noise environment will be achieved subject to the implementation of modest acoustic treatments. This will ensure future occupants are exposed to aircraft noise levels that are reasonable and will avoid the potential for complaints which may give rise to potential reverse sensitivity effects arising on Auckland International Airport. This approach is consistent with Policy 5 of D24 of the AUP and will assist in addressing assessment matters (1)(a) and (c) in D24.8.2.1.

Construction noise and vibration

Chapter E25 provides standards to manage and control noise and vibration effects from construction activities. We anticipate that the construction noise and vibration effects from this project will be typical of a large scale residential development. The separation distances between the Site and adjacent receivers will likely enable comfortable compliance with the construction noise limits in E25.6.27 and the construction vibration limits in E25.6.30 of the AUP.

We will prepare a construction noise and vibration assessment, that includes construction noise and vibration predictions at the nearby receivers. We will confirm the noise mitigation and management measures to ensure that construction noise and vibration effects at nearby receivers will be reasonable. We will recommend that a Construction Noise and Vibration Management Plan (CNVMP) is implemented prior to commencement of construction. The CNVMP will identify all practicable mitigation options for the appropriate management of construction noise and vibration throughout the construction phase, in accordance with Annex E of NZS 6803:1999 *Acoustics – Construction Noise*.

Additional acoustic recommendations

Traffic noise exposure

The Site is exposed to traffic noise from State Highway 20 (the Southwestern motorway). The AUP does not provide any acoustic insulation rules or standards for noise sensitive activities constructed in proximity to high traffic noise environments.

Waka Kotahi - NZTA's *Guide to the management of effects on noise sensitive land use near to the state highway network* recommends that new or altered buildings containing noise sensitive activities exposed to state highway noise should be designed, constructed and maintained to meet a maximum indoor noise level of 40 dB $L_{Aeq(24h)}$.

We recommend that applying acoustic treatments to ensure the future dwellings meet an internal noise level of 40dB $L_{Aeq(24h)}$ is appropriate. Achieving this internal noise level will avoid potentially significant adverse health and annoyance effects on building occupants and will avoid the potential for reverse sensitivity effects to arise on Waka Kotahi as the road controlling authority.

Styles Group will use Waka Kotahi's traffic flow data to inform the creation of a traffic noise model. This will determine the traffic noise exposure across the Site. We will provide design recommendations to ensure all future dwellings on the Site are constructed to achieve an internal noise level of 40dB $L_{Aeq(24h)}$ in accordance with Waka Kotahi's design criteria. We anticipate that modest acoustic treatments will be required to ensure that the noise sensitive spaces exposed to traffic noise will receive indoor noise levels no greater than 40dB $L_{Aeq(24hr)}$.

Conclusion

Styles Group are undertaking a comprehensive air and traffic noise exposure assessment for the proposed residential development at 1 Sells Road, Papatoetoe.

Our assessment will determine the acoustic treatments required to ensure the proposed dwellings achieve the internal noise environment specified in the AUP (for dwellings in the MANA and ANNA of Auckland Airport) and Waka Kotahi guidelines (for dwellings exposed to State Highway noise).

These measures will ensure future occupants of the Site are protected from unreasonable levels of noise inside the dwellings. These measures will also prevent reverse sensitivity effects arising on Auckland International Airport and Waka Kotahi. We have reviewed the proposed housing typologies and are satisfied the acoustic upgrades to the proposed dwellings are likely to be modest.

Styles Group are also undertaking a construction noise and vibration assessment to determine the management and mitigation measures required to properly manage the effects arising from the construction phase. We anticipate that these assessments will be straightforward, and we do not expect that there will be any particular challenges in achieving a reasonable level of noise and vibration in the surrounding environment.

Please contact me if you require any further information.

Yours sincerely,



Jon Styles, MASNZ
Director and Principal

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