1/355 Manukau Road
Epsom, Auckland 1023

T: 09 638 8414
E: rhys.hegley@acoustics.co.nz

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Simon Ash
Winton Land Limited
PO Box 105526
Auckland 1143

Dear Simon

SUNFIELD – ACOUSTIC REVIEW

Thank you for a copy of the proposed master plan for the Sunfiled development proposed for Takanini and the accompanying Assessment of Noise Effects (ANE)[1] prepared by Styles Group. As requested, I have reviewed the ANE.

The ANE is dedicated to the consideration of aircraft noise from Ardmore Aerodrome, which is the sole issue I believe requires consideration. To this end, the ANE correctly identifies chapter D24 of the Auckland Unitary Plan – Operative in Part (AUP) as containing the relevant provisions. This review considers whether the master plan described by the ANE is consistent with D24.

The ANE considers noise effects in four bandwidths:

a. Within the 65dB L_{dn} contour (the Air Noise Boundary (ANB));
b. Between the 60 – 65dB L_{dn} contours;
c. Between the 55 – 60dB L_{dn} contours; and
d. Outside the 55dB L_{dn} contour.

In section 2, the ANE notes that "*The Sunfield masterplan has been designed to align with the existing operative airport noise boundaries.*". In principle, I agree with this approach as, in the most general of terms, it is based on appropriate land use planning. Specifically, the structure of the master plan links the development of Activities Sensitive to Aircraft Noise[2] (ASAN) with reducing levels of aircraft noise.

WITHIN THE ANB.

Land within the ANB represents the highest level of aircraft noise across the master plan area. The ANE recommends that land within this area align with Policy D24.3(1) of the AUP which

[1] Assessment of Noise Effects, Sunfield Masterplanned Community, Takanini. Winton Land Limited, 8 February 2025, Rev 5.

[2] The AUP defines an ASAN as any dwellings, boarding houses, marae, papakāinga, integrated residential development, retirement villages, supported residential care, care centres, education facilities, tertiary education facilities, hospitals, and healthcare facilities with an overnight stay facility.

seeks to "*avoid the establishment of new activities sensitive to aircraft noise (except tertiary education facilities) within the 65dB L_{dn} noise contour in the Aircraft Noise Overlay*" and that the activities Table applies a prohibited activity status to new ASAN inside the ANB.

The master plan shows land within the ANB as being within the Employment Area which the ANE describes as designed to provide for industrial type activities such as warehousing.

My view is that the ANE, and master plan, are consistent with D24 with respect to land within the ANB.

60 – 65dB L_{dn}

With this area receiving elevated levels of aircraft noise, the master plan takes a pragmatic view for land between the 60 – 65dB L_{dn} contours by proposing activities other than ASAN and, in particular, retail and service activities in the Town Centre, healthcare activities inside the Health Care area and retail and service activities inside the Local Hub. The areas of Open Space are intended to provide for active/organised recreation.

These proposed land uses appear consistent with the AUP as Table D24.4.2 applies a discretionary activity status to new ASAN, where they are designed and constructed in accordance with the relevant acoustic treatment standards of the AUP. I note that unlike land within the ANB, ASAN are not prohibited and could be expected, albeit to a lesser extent, than on land beyond the 60dB L_{dn} contour. For completeness, ASAN are a non-complying activity where they do not comply with the specified acoustic treatment requirements.

This section of the ANE specifically discusses overnight facilities associated with the likes of hospitals and other healthcare facilities. I agree with the conclusions of the ANE that with, at best, limited outdoor amenity areas, it is practicable to design and construct such facilities to adequately control the adverse effects of aircraft noise.

The ANE describes the Open Space areas proposed with the 60 – 65dB L_{dn} contours as being intended for active forms of recreation which it considers are not particularly noise sensitive (they are not an ASAN). Similar spaces will be provided outside of the 55dB L_{dn} contour for passive recreation. I consider this an appropriate solution.

55 – 60dB L_{dn}

The 55dB L_{dn} contour, which defines the Outer Control Boundary (OCB) marks the extend to the aircraft noise effects considered by the AUP.

The master plan proposes Employment, Town Centre, Aged Care and Residential development for this area, signalling the master plan's intention to concentrate the ASAN within this bandwidth provided they are acoustically treated to control internal levels of aircraft noise. This proposal is consistent with A20 and A21 of Table D24.4.2 which specifies a restricted discretionary activity status for ASAN between the 60 dB L_{dn} noise contour and the ONB when building facades are designed to control the ingress of aircraft noise in accordance with D24.6.2(1), D24.6.2(4) and D24.6.2(5).

BEYOND THE 55dB L_{dn} CONTOUR (OCB)

Being beyond the AUP's interest in aircraft nose, I agree with the ANE that "*We consider that there is no need to manage exposure to aircraft noise in this area.*"

MECHANICAL VENTILATION

When designing building facades to control the ingress of aircraft noise, it is a typical necessity that windows remain closed to achieve the necessary mitigation. As those same windows are typically relied upon to ventilate the spaces, D24.6.2 also provides a rule for alternative ventilation. The ANE suggests updating these rules to match those of E25.6.10(3)(b) to (f). Ventilation is outside my area of expertise, and I limit my comments to what appears to be the obvious benefit of adding air conditioning (through E25.6.10(3)) and that the rule has been used successfully for some time for ASAN that experience elevated noise levels from both other airports and sources other than aircraft.

MANAGEMENT OF AIRCRAFT NOISE UNDER CHAPTER D24 OF AUP

The ANE provides the relevant objectives and policies of D24 which, in summary, relate to reverse sensitivity effects on Ardmore aerodrome and aircraft noise effects on ASAN within the master plan.

In response, the ANE addresses the effects of noise on people within the residential environment, which reflects the approach of international literature. With respect to that literature, the ANE cautions the use of the often referred to Guidelines[3] of the World Health Organization (WHO) as these, correctly, focus on noise effects but do not extend to the other non-acoustic factors that may require consideration when deciding upon land use development. Further, the ANE points out the difference between those living in the purpose designed dwellings in a known aircraft noise area intended by the master plan and the unknown situation of those considered by the Guidelines. I accept these limitations of the published research. My view is that the use of the published data requires discretion. The trends shown are useful when considering effects but absolute reliance on it is not.

The ANE goes on to consider internal and external effects separately. I agree that, through appropriate design and construction of building envelopes (in accordance with D24.6.2), internal noise levels within future ASAN can be appropriately addressed. I consider this to be the current best practice approach to addressing internal effects from not only other airports but noise generators more generally where decision makers opt, on balance, to develop ASAN within the noise effects areas of roads, ports or business zones.

In addressing external effects, I agree with the ANE that published annoyance curves cannot be used solely for the purpose of quantifying outdoor effects. I therefore support the first principles assessment of outdoor effects provided by the ANE where it notes that '*the noise level of aircraft overhead will range subjectively from being inaudible at times or distant but noticeable, through to close and loud enough to affect outdoor conversation, especially if the distance between people talking is more than a few metres*'. To place these effects into context, the ANE notes similar effects would be experienced by those '*living a short distance from a busy road, but less than what would be experienced living next to a busy road*'. I consider this an apt description of effects as too the overall conclusion that the effects would be moderate.

Section 8 of the ANE does not directly reference reverse sensitivity in its response to D24. The second paragraph notes that '*The Airport's noise contours define the locations at which the maximum sound exposure, expressed in L_{dn} dBA, must not be exceeded. The Airport must operate in compliance with the noise limits specified at the ANB*'. The assumption required by the reader is that, provided the airport is operating within its noise contours, any authorized ASAN would not result in a reverse sensitivity effect. This is on the basis that the ANE

[3] https://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf

demonstrates reasonable effects to such ASAN, which I believe it has done. Regardless, it would be useful if the ANE were more explicit on this issue.

The ANE does not dwell on the issue of ASAN density, which is referenced by policies D24.3(3) and (5) and assessment criteria D24.8.3.1(5). I am not aware of any relationship between the density of residential development (the common proxy for ASAN in acoustic literature), and the effects on individuals within those dwellings. Unhelpfully, D24 provides no guidance on this issue.

I note that D24's land use planning approach (which has been adopted by the ANE) is, to a degree, density related with no ASAN being proposed for the highest noise area (within the ANB), limited ASAN proposed between the 60 – 65dBL_{dn} contours leaving the lowest noise area (55 – 60dB L_{dn}) and beyond for ASAN. On this point, the ANE notes in the last paragraph of section 8.3 that '*We understand that the density proposed by the resource consent application generally aligns with the established density of existing residential development on the western side of Cosgrave Road that is also inside the ONB*'.

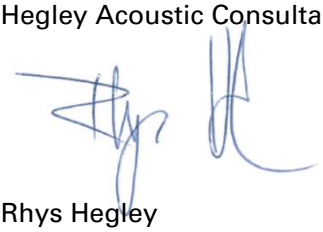
From the above, I consider that beyond adopting the land use planning approach described by D24 (for which there is no objective measure), the density of ASAN is outside of the scope of acoustics.

CONCLUSIONS

From my review, I consider that the ANE described approach to the master plan is consistent with chapter D24 of the AUP. In more simple terms, the ANE shows that it would be practicable to develop the master plan such that aircraft noise effects on the future occupants would be appropriate. This is not to say that there would be no effects, rather that the effects are manageable if, on the whole, decision makers determine the master plan is appropriate. I consider that the ANE would benefit from a more detailed assessment of potential reverse sensitivity effects, but do not consider that doing so would alter my conclusions.

Should you have any questions regarding the above please do not hesitate to contact me.

Yours sincerely
Hegley Acoustic Consultants



Rhys Hegley