AIF = Outside L_{eq} (24 h) – Indoor L_{eq} (24 h) + 10 $\log_{10}$(N) + 2dBA

Where: Outside Leq (24hr) = The maximum unattenuated noise level (Table 4).
Indoor Leq (24hr) = The maximum allowable noise level (Table 1).
N = The number of components forming the exterior

Table 4 summarizes the AIF calculations for each of the receivers. A sample calculation is provided below.

Sample Calculation at Receiver POW 2 on the 8th floor assuming 2 exterior components:

$AIF_{(Daytime)}$ = 70.7 dBA – 45 dBA + 10log(2) + 2dBA
$AIF_{(Daytime)}$ = 30.7 dBA
$AIF_{(Daytime)}$ = 31 dBA (rounded)

$AIF_{(Nighttime)}$ = 63.1 dBA – 40 dBA + 10log(2) + 2dBA
$AIF_{(Nighttime)}$ = 28.1 dBA
$AIF_{(Nighttime)}$ = 28 dBA (rounded)

The higher of the two AIF values (daytime verses nighttime) is considered. The AIF for POW 2 on the 8th floor is therefore 31.

Table 4: Minimum Required Acoustic Insulation Factor (AIF)

Receiver	Location		Minimum Required AIF Values	
	Building Face	Floor	2 Components	3 Components
OLA 1	South	1	N/A	N/A
POW 1	West	1	22	24
		8	27	28
POW 2	North	1	30	32
		8	31	32
POW 3	East	1	27	29
		8	30	31
POW 4	South	1	14	16
		8	18	20

The AIF values listed in Table 4 – Minimum Required Acoustic Insulation Factor (AIF) are used to determine the type of window and wall assembles required to attenuate the noise levels. This is done by using Tables 5 and 6 listed in **Appendix C**. **Table 5 – Acoustic Insulation Factor for Various Types of Windows** is used to select or verify the adequacy of the window assembly. **Table 6 – Acoustic Insulation Factor for Various Types of Exterior Wall** is used to select or verify the adequacy of the wall construction. Tables 11 and 12 in Appendix C can then be used to convert the AIF values to STC values which builders are more accustomed to.

Once detailed drawings are provided by the architect, these calculations will be performed and window/door and wall assembles will be selected and verified.

In addition to the above-noted attenuation measure, the following warning clause is to be included in the Agreement of Purchase and Sale.

"Purchasers/tenants are advised that sound levels due to increasing road/rail/light-rail/transitway traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment. To help address the sound attenuation this development includes multi-pane glass and upgraded exterior walls.

To ensure provincial sound level limits are not exceeded this unit has been supplied with a central air conditioning system and other measures which all windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment."

Due to the site being located within the OAVDZ, the following warning clause is to be included in the Agreement of Purchase and Sale.

"Purchasers/tenants are advised that due to the proximity of the airport, noise from the airport and individual aircraft may at times interfere with outdoor or indoor activities."

5.0 CONCLUSIONS

This report assessed the impact of noise levels from traffic on Hunt Club Road and the Airport Parkway on the proposed retirement building. Due to the noise levels exceeding ENCG guidelines, the following attenuation measure are proposed:

- Construction of window/door and wall assembles to satisfy the calculated AIF levels in Table 4. These calculations will be performed once final architectural drawings are received, and this report will be up-dated accordingly.

- Provision of the following Warning Clauses in Purchase and Sale Agreements and Rental Agreements.

  "Purchasers/tenants are advised that sound levels due to increasing road/rail/light-rail/transitway traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment. To help address the sound attenuation this development includes multi-pane glass and upgraded exterior walls.

  To ensure provincial sound level limits are not exceeded this unit has been supplied with a central air conditioning system and other measures which all windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment"

  "Purchasers/tenants are advised that due to the proximity of the airport, noise from the airport and individual aircraft may at times interfere with outdoor or indoor activities."