ROCKY VIEW COUNTY

BUILDING SERVICES

Airport Vicinity Protection Area – Acoustic Insulation Requirements

Guideline

Guideline ESP - 34

Purpose

This guideline has been developed to clarify and enhance understanding of the Code requirements for the Airport Vicinity Protection Area – Acoustic Insulation Requirements in Rocky View County.

Code Reference

Current National Building Code – Alberta Edition, Part 11 - Exterior Acoustic Insulation

Summary

This guideline provides clarity and direction from Rocky View County regarding their interpretation of the Airport Vicinity Protection Area – Acoustic Insulation Requirements. It outlines the affected area (AVPA – NEF 25 zone) and the corresponding acoustic insulation requirements.

Conclusion

Rocky View County – AVPA Guideline for Residential Acoustic Envelope Compliance

Applies to: All single-family residential properties located within the NEF 25 Noise Contour.

Note: Any other type of building will require the involvement of a qualified design professional, such as an architect or engineer, along with stamped plans.

1. What is the Challenge?

Properties located within the **Airport Vicinity Protection Area (AVPA)** are exposed to higher levels of aircraft noise. To protect interior living spaces from noise, the current **National Building Code – Alberta Edition,** requires that walls, windows, doors, ceilings, and roofs meet minimum **Acoustic Insulation Factor (AIF)** ratings.

In simple terms:

- Every **exterior-facing wall, window, door, and ceiling/roof** must be designed to block a certain amount of noise.
- The amount of noise reduction required depends on:
    1. **Room type** (e.g., bedroom, living room, bathroom).
    2. **The number of exterior components** in the room (wall, window, door, ceiling/roof, skylight, cantilevered floor.).
    3. **The area of windows, doors, and walls** compared to the room floor area.

2. Where Does This Apply?

- **All homes inside the NEF 25 contour** of the AVPA.
- This includes all conditioned interior rooms such as bedrooms, living rooms, dining rooms, recreation rooms, kitchens, bathrooms, offices, laundry rooms, and other similar rooms.

3. How to Comply – Step-by-Step Checklist

Use this list to prepare drawings and demonstrate compliance:

Required on Drawings:

- Window-to-floor area calculations.
- Door-to-floor area calculations.
- Window and door details (with manufacturer specifications).
- Wall assembly details (choose from standard options or, provide professional architect or engineer design).
- Ceiling/roof construction detail.
- Fresh air mechanical ventilation air-intake detail.

Note:

- While the Code allows redistribution of AIF between components (e.g., a lower-rated window compensated by a higher-rated wall), such designs must be prepared by a qualified building envelope professional (e.g., architect, engineer).

Refer to the window and door calculations and detail examples in the table below—these details must be included in the drawings.

Room	No. of Components	Required AIF	(Window area) / (Floor area) = Window Area	Window AIF	Window Specs (Example of minimum requirment)
Bedroom	3	30	(4'*4')/(10'*10') = 16%	30	Double-glazed unit, 2 mm glass, 13 mm interpane spacing
Living Room	3	25	(4'*4' + 8'*5' + 3'*3')/(20'*20') = 16.25%	28	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Dining Room	3	25	(6'*4' + 5'*5')/(12'*15') = 27.22%	26	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Recreation Room	3	25	(6'*5' + 4'*4' + 3'*5')/(18'*22') = 15.4%	29	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Kitchen	3	20	(4'*3' + 5'*4')/(14'*12') = 19.05%	28	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Bathroom	3	20	(2'*2' + 2'*3')/(8'*10') = 12.5%	30	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Office	2	18	(4'*4' + 3'*5')/(10'*12') = 25.83%	26	Double-glazed unit, 2 mm glass, 6 mm interpane spacing
Laundry Room	2	18	(2'*2' + 2'*3')/(9'*8') = 13.89%	29	Double-glazed unit, 2 mm glass, 6 mm interpane spacing

Room	No. of Components	Required AIF	(Door area) / (Floor area) = Door Area	Door AIF	Door Specs (Example of minimum requirment)
Bedroom	3	30	(3'*6'-8")/(10*10) = 17.9%	30	D4 - 44 mm steel door with foam or glass-fibre insulated core
Living Room	3	25	(3'*6'-8")/(20'*20') = 5.0%	29	D1 - 44 mm hollow-core wood door (up to 20% of area glazed).
Dining Room	3	25	(6'*6'-8")/(12'*15') = 22.2%	26	D2 - 44 mm glass-fibre reinforced plastic door with foam
Recreation Room	3	25	(5'*6'-8")/(18'*22') = 8.42%	26	D1 - 44 mm hollow-core wood door (up to 20% of area glazed).
Kitchen	3	20	(3'*6'-8")/(14'*12') = 11.9%	25	D1 - 44 mm hollow-core wood door (up to 20% of area glazed).
Bathroom	3	20	N/A	N/A	N/A
Office	2	18	N/A	N/A	N/A
Laundry Room	2	18	N/A	N/A	N/A

How to Do the Calculations:

Windows (Table 11.2.3.1-A):

1. Calculate window area as % of floor area.
2. Round up to the next listed percentage if exact value is not shown.
3. Find corresponding AIF requirement.
4. Choose a window assembly meeting/exceeding that AIF.
5. *Example:* Sleeping room with three exterior components, each AIF = 30.

Table 11.2.3.1.-A
Acoustic Insulation Factor for Various Types of Window Glazing
Forming Part of Sentence 11.2.3.1.(1)

Acoustic Insulation Factor[1][2]														Single Glazing Thickness, mm	Interpane Spacing, mm						
Window Area as a Percentage of Total *Floor Area* of Room or Space[6]															Double Glazing[3][4]					Triple Glazing[5]	
4	5	6	8	10	13	16	20	25	32	40	50	63	80		2 mm and 2 mm glass	3 mm and 3 mm glass	4 mm and 4 mm glass	3 mm and 6 mm glass	6 mm and 6 mm glass	3 mm, 3 mm and 3 mm glass	3 mm, 3 mm and 6 mm glass
35	34	33	32	31	30	29	28	27	26	25	24	23	22	2	6						
36	35	34	33	32	31	30	29	28	27	26	25	24	23		13						
37	36	35	34	33	32	31	30	29	28	27	26	25	24	3	15	6					
38	37	36	35	34	33	32	31	30	29	28	27	26	25	4, 6	18	13	6				
39	38	37	36	35	34	33	32	31	30	29	28	27	26		22	16	13	6	6	6, 6	
40	39	38	37	36	35	34	33	32	31	30	29	28	27	9[7]	28	20	16	13	13	6, 10	6, 6
41	40	39	38	37	36	35	34	33	32	31	30	29	28		35	25	20	16	16	6, 15	6, 10
42	41	40	39	38	37	36	35	34	33	32	31	30	29	12[7]	42	32	25	20	20	6, 20	6, 15
43	42	41	40	39	38	37	36	35	34	33	32	31	30		50	40	32	25	24	6, 30	6, 20
44	43	42	41	40	39	38	37	36	35	34	33	32	31		63	50	40	32	30	6, 40	6, 30
45	44	43	42	41	40	39	38	37	36	35	34	33	32		80	63	50	40	37	6, 50	6, 40
46	45	44	43	42	41	40	39	38	37	36	35	34	33		100	80	63	55	50	6, 65	6, 50
47	46	45	44	43	42	41	40	39	38	37	36	35	34		125	100	80	75	70	6, 80	6, 65
48	47	46	45	44	43	42	41	40	39	38	37	36	35		150	125	100	95	90	6, 100	6, 80
49	48	47	46	45	44	43	42	41	40	39	38	37	36			150	125	110	100		6, 100
50	49	48	47	46	45	44	43	42	41	40	39	38	37				150	135	125		

Notes to Table 11.2.3.1.-A:

(1) *Acoustic insulation factor* data listed in the Table are for well-fitted weatherstripped units that can be opened. The *acoustic insulation factor* values apply only when the windows are closed. For windows fixed and sealed to the frame, add 3 to the *acoustic insulation factor* given in the Table.

(2) The *acoustic insulation factor* data listed in the Table are for typical windows, but details of glass mounting, window seals, etc. may result in slightly different performance for some manufacturers' products. If laboratory sound transmission loss data (conforming to ASTM E90, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements") are available, these may be used to calculate the *acoustic insulation factor*.

(3) If the interpane spacing or glass thickness for a specified double-glazed window is not listed in the Table, the nearest listed values should be used.

(4) For easy reference, glazing dimensions may be written in the form 2(100) to denote 2 mm glass (100 mm space) 2 mm glass.

(5) If the interpane spacings for a specified triple-glazed window are not listed in the Table, use the listed case whose combined spacings are nearest to the actual combined spacing.

(6) If the calculated percentage window area is not presented as a column heading, the nearest higher percentage column in the Table should be used.

(7) The *acoustic insulation factor* ratings for 9 mm and 12 mm glass are for laminated glass only; for solid glass subtract 2 from the *acoustic insulation factor* values listed in the Table.

Doors (Table 11.2.3.1-D):

1. Calculate door area as % of floor area.
2. Round up to the next listed percentage if exact value is not shown.
3. Find corresponding AIF requirement.
4. Choose an approved door type.
5. *Example:* Sleeping room with four exterior components, each AIF = 31.

Table 11.2.3.1.-D
Acoustic Insulation Factor for Exterior Doors
Forming Part of Sentence 11.2.3.1.(1)

Type of Exterior Door[1][2][3][4]	Percentage of Total Exterior Door Area to Total *Floor Area* of Room or Space[5]								
	4	5	6.3	8	10	12.5	16	20	25
D1	30	29	28	27	26	25	24	23	22
D2	34	33	32	31	30	29	28	27	26
D3	36	35	34	33	32	31	30	29	28
D4	37	36	35	34	33	32	31	30	29
DR or D1 - sd	38	37	36	35	34	33	32	31	30
D2 - sd	41	40	39	38	37	36	35	34	33
D3 - sd	43	42	41	40	39	38	37	36	35
D4 - sd	44	43	42	41	40	39	38	37	36
D5 - sd	45	44	43	42	41	40	39	38	37
D3 - D3	48	47	46	45	44	43	42	41	40
D5 - D5	50	49	48	47	46	45	44	43	42

Notes to Table 11.2.3.1.-D:

(1) All exterior doors must be fully weatherstripped.

(2) D1 denotes 44 mm hollow-core wood door (up to 20% of area glazed).
D2 denotes 44 mm glass-fibre reinforced plastic door with foam or glass-fibre insulated core (up to 20% of area glazed).
D3 denotes 35 mm solid slab wood door.
D4 denotes 44 mm steel door with foam or glass-fibre insulated core.
D5 denotes 44 mm solid slab door.

(3) sd denotes storm door of wood or aluminum with openable glazed sections. The *acoustic insulation factor* values apply when the glazed sections are closed.

(4) Except as noted specifically above, doors shall not have inset glazing.

(5) If the calculated percentage of door area is not presented as a column heading, the nearest higher percentage column in the Table should be used.

4. Easy Compliance Options – Standard Assemblies & Ventilation

Rocky View County has **pre-approved assemblies** that may be used without professional Part 11 design.

Exterior Walls – Choose one upgrade:

- ½" gypsum board + vapour barrier + 2×6 studs + batt insulation + OSB + cladding, plus:
    - **Option A:** Add 9.5 mm wood fibreboard (heated interior only), OR
    - **Option B:** Use 2 layers of ½" Type C drywall (interior), OR
    - **Option C:** Add resilient channels (interior), OR
    - **Option D:** Add exterior insulation (fibre or polystyrene).

This meets requirements for **all sleeping and living spaces** in NEF 25 areas.

Windows

- Must meet the AIF rating shown in Table 11.2.3.1-A.
- Ratings depend on **window size compared to room floor area**.

Exterior Doors

- Must meet the AIF rating in Table 11.2.3.1-D.
- Ratings depend on **door size compared to room floor area**.

Ceilings/Roofs

- Use standard construction (C1 or better).

Mechanical Ventilation (Required in NEF 25)

- 6" insulated, dampered fresh-air intake.
- Must meet ventilation requirements **without reducing acoustic protection**

5. Acoustic Insulation Factor (AIF)

Definition:

- **AIF = sound-blocking ability.**
- **Higher AIF = better noise protection.**

Counting Exterior Components:

- Exterior components include: wall, ceiling/roof, door, window, skylight, cantilevered floor.
- Each type is counted **once**, no matter how many are present.
- Example: A bedroom with a ceiling / roof, 2 walls, 2 windows, and 1 door has **4 exterior components.**

Applying Values:

- The number of exterior components in a room determines the minimum AIF each must achieve.
- Example: A bedroom with 4 components requires **AIF 31** for each (**4:31**).
- Use the tables below to find the correct value for each room type.

Minimum AIF Values for the Noise Contour at Building Site - Factor 25

(by Room Type & Number of Exterior Components)

Sleeping Rooms (Table 11.2.1.2-A):

- 6:33 5:32 4:31 3:30 2:28 1:25

Living/Dining/Recreation (Table 11.2.1.2-B):

- 6:28 5:27 4:26 3:25 2:23 1:20

Kitchen/Bath/Office/Laundry (Table 11.2.1.2-C):

- 6:23 5:22 4:21 3:20 2:18 1:15

See example in the Table 11.2.1.2.-A below

Table 11.2.1.2.-A
Acoustic Insulation Factors
Forming Part of Sentence 11.2.1.2.(1)

Number of Components Forming Exterior Portion of Room or Space Envelope	*Noise Contour* at *Building* Site																
	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Over 40
1	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	43
2	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	46
3	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	48
4	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	49
5	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	50
6	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	51

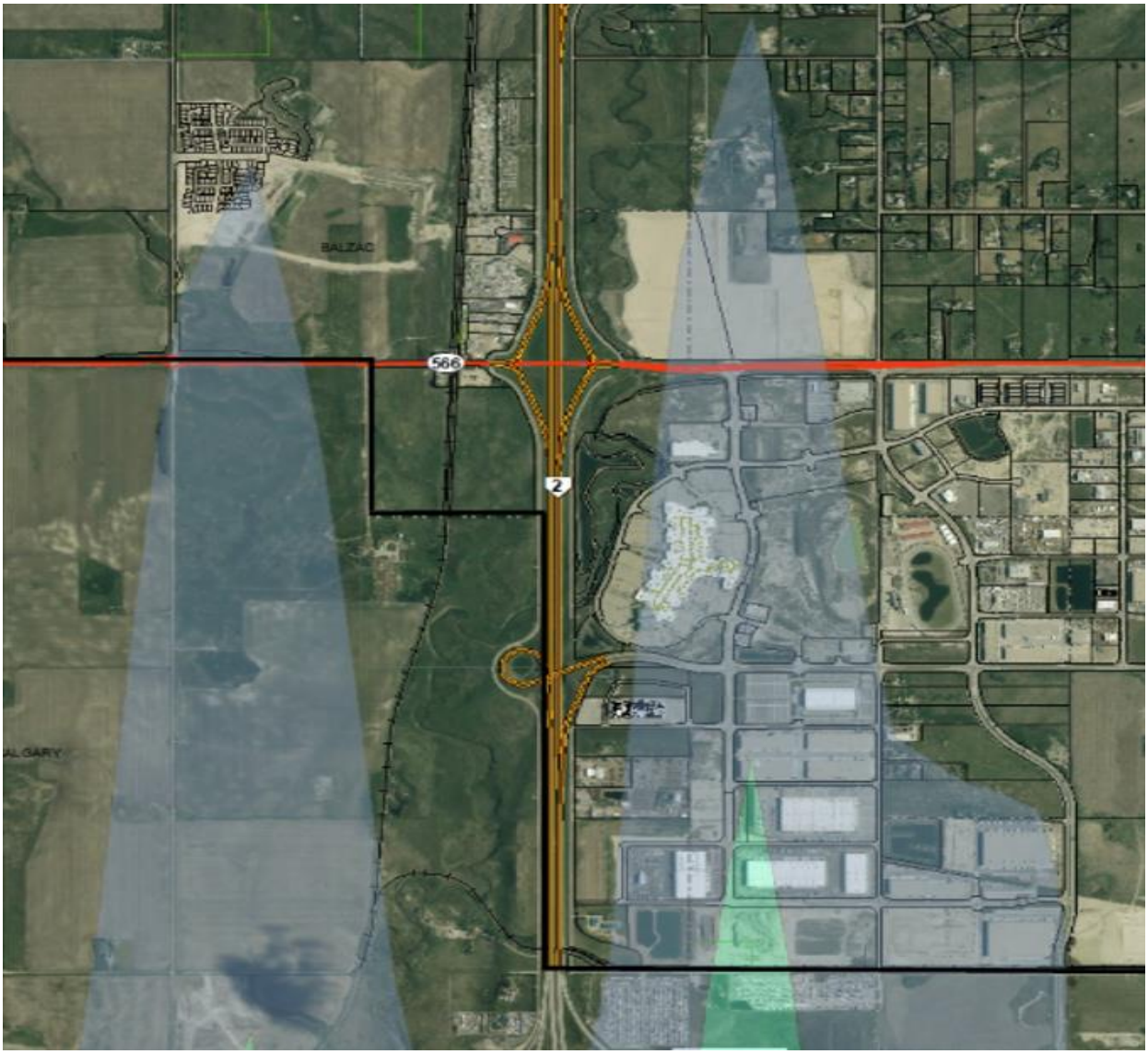
6. Need Help?

Contact the **Rocky View County Building Safety Codes Office** before submitting your permit application for:

- Clarification of requirements.

Advisory: Construction details outside of this guideline will require professional involvement from an Architect or Engineer.

Map of the Airport
Vicinity Protection Zone in Rocky View County



Reference

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