



PLANNING, PROPERTY
AND DEVELOPMENT
DEPARTMENT

Airport Vicinity Acoustic Insulation

***By-law No. 6419/94 of the City of
Winnipeg to establish minimum
acoustic insulation requirements for
buildings within the Airport Vicinity
Protection Area***

SECTION 1. GENERAL

This document is based on the "AIRPORT VICINITY ACOUSTIC INSULATION BY-LAW", 6419/94.

SECTION 2. APPLICATION

2.1. Scope. This By-Law applies to all new residential one-family, two-family and multi-family dwellings to be constructed, subject to acoustic insulation requirements, within an airport vicinity protection area as defined and outlined in the Zoning By-Law.

2.2. Work. All work required by this By-law shall be carried out in accordance with the Manitoba Building Code, the Winnipeg Building By-law, and the Winnipeg Electrical By-law.

2.3. Powers. The Designated Employee shall be responsible for the administration and enforcement of this By-law, and in this regard shall have the same powers as detailed in the Winnipeg Building By-law for the Authority Having Jurisdiction.

2.4. Definitions. Unless otherwise expressly provided or unless the context requires, words and expressions in this By-law have the same meaning as the same words and expressions in the Manitoba Building Code and the Winnipeg Building By-law.

- *Acoustic Insulation Factor* means a number that is used as a measure of the reduction in the level of aircraft noise provided by the assemblies forming the exterior envelope of a *building*.
- *Noise contour* means the value of the noise exposure forecast or the noise exposure projection at a particular building site as shown on the map attached hereto and shown as Schedule A to this By-law

SECTION 3. DESIGN

3.1. GENERAL

3.1.1. Design. In the application of Tables 3.1.A. to 3.1.E., the number components forming the exterior portion of a room or space envelope shall be the total of all the types of exterior elements or assemblies that form the room or space including windows, doors, etc. The component area shall be the combined area of those elements or assemblies.

3.1.2. Acoustic Insulation Factor

(1) The building shall be designed and constructed so that the acoustic insulation factor for each component of the exterior envelope of every room or space used for sleeping shall not be less than the value derived from Table 3.1.A

(2) The building shall be designed and constructed so that the acoustic insulation factor for each component of the exterior envelope of every living room, dining room, recreation room and all other rooms of a similar nature shall not be less than the value derived from Table 3.1.B

(3) The building shall be designed and constructed so that the acoustic insulation factor for each component of the exterior envelope of every kitchen, bathroom, laundry room and all other rooms of a similar nature shall not be less than the value derived from Table 3.1.C.

(4) The building shall be designed and constructed so that the acoustic insulation factor for each component of the exterior envelope of general office areas, reception areas, and all other rooms and spaces not included in Sentences (1) to (3) is not less than the value derived from Table 3.1.D.

3.1.3. Multiple Factors

(1) If one or more components of the exterior envelope of a *building* have an *acoustic insulation factor* that is more than the value required by Sentences 3.1.2.(1) to (4) the *acoustic insulation factor* for one or more other components of the exterior envelope of the *building* may be less than the value required by Sentences 3.1.2.(1) to (4) if

- (a) the algebraic increase in transmitted sound power is not positive, and
- (b) Table 3.1.E. is used to redistribute the *acoustic insulation factor* requirements for components whose *acoustic insulation factor* deviates from the value required by Sentences 3.1.2.(1) to (4).

3.2. VENTILATION

3.2.1. Mechanical Ventilation

(1) In *buildings* located on a site at which the *noise contour* value is 25 or more, *dwelling units* and *suites* used for *residential occupancy* shall be ventilated with a mechanical ventilation system that shall include a fresh air inlet duct that

- (a) has a minimum diameter of 150 mm,
- (b) is insulated,
- (c) has a regulating damper that does not conflict with the requirements of Sections 32 and 33 of the *code*, and
- (d) conducts outside air to the *return duct*.

(2) If the *noise contour* value at a *building* site is more than 30, the mechanical ventilation system required by Sentence (1) shall be designed and installed in such a way that an owner or occupant of a *dwelling unit*, or *suite* used for *residential occupancy* need not make changes to the structure or dimensional changes to the ventilation system in order to install an air-conditioning system.

3.3. TYPICAL ASSEMBLIES

3.3.1. Values for Building Components

Tables 3.3.A. to 3.3.D. may be used to determine the *acoustic insulation factor* for some typical construction materials and assemblies, including windows, doors, exterior walls and roofs.

Table 3.1.A.
Forming Part of Sentence 3.1.2.(1)

Acoustic Insulation Factor for each Component of the Exterior Envelope of Rooms and Space Used for Sleeping

| 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 | |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | 18 | |

Table 3.1.B.
Forming Part of Sentence 3.1.2.(2)

Acoustic Insulation Factor for the Exterior Envelope of Living Rooms, Dining Rooms, Recreational Rooms, etc.

| 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 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 38 | |
| 2 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 41 | |
| 3 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 43 | |
| 4 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 44 | |
| 5 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 45 | |
| 6 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 46 | |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |

Table 3.1.C.
Forming Part of Sentence 3.1.2.(3)

Acoustic Insulation Factor for the Exterior Envelope of Kitchens, Bathrooms, and Laundry Rooms

| 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 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 33 | |
| 2 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 36 | |
| 3 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 38 | |
| 4 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 39 | |
| 5 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 40 | |
| 6 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 41 | |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |

Table 3.1.D.
Forming Part of Sentence 3.1.2.(4)

**Acoustic Insulation Factor for the Exterior Envelope of General Offices, Reception Areas
and Other Rooms and Spaces not Included Under Tables 3.1.A. to 3.1.C.**

| 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 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 28 | |
| 2 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 31 | |
| 3 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 33 | |
| 4 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 34 | |
| 5 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 35 | |
| 6 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 36 | |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |

Table 3.1.E.
Forming Part of Sentence 3.1.3.(1)

Redistribution of Acoustic Insulation Factors

| Component acoustic insulation factor from Tables 3.3.A. to 3.3.0. minus acoustic insulation factor derived from Tables 3.1.A. to 3.1.0. | Total Number of Components | | | | |
|--|--|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 |
| | Percentage change in total transmitted sound power | | | | |
| 10 or more | -45 | -30 | -22 | -18 | -15 |
| 9 | -44 | -29 | -22 | -18 | -15 |
| 8 | -42 | -28 | -21 | -17 | -14 |
| 7 | -40 | -27 | -20 | -16 | -13 |
| 6 | -37 | -25 | -19 | -15 | -12 |
| 5 | -34 | -23 | -17 | -14 | -10 |
| 4 | -30 | -20 | -15 | -12 | -11 |
| 3 | -25 | -17 | -12 | -10 | -8 |
| 2 | -18 | -12 | -9 | -7 | -6 |
| 1 | -10 | -7 | -5 | -4 | -3 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| -1 | 13 | 9 | 6 | 5 | 4 |
| -2 | 29 | 20 | 15 | 12 | 10 |
| -3 | 50 | 33 | 25 | 20 | 17 |
| -4 | 76 | 50 | 38 | 30 | 25 |
| -5 | 108 | 72 | 54 | 43 | 36 |
| Column 1 | 2 | 3 | 4 | 5 | 6 |

Table 3.3.A.
Forming Part of Article 3.3.1.

Acoustic Insulation Factor for Various Types of Window Glazing

| Acoustic Insulation Factor | Single Glazing Thickness mm | Interpane spacing, mm | | | | | | |
|---|-----------------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| | | Double Glazing | | | | | Triple Glazing | |
| | | 2mm & 2 mm glass | 3mm & 3mm glass | 4mm & 4mm glass | 3mm & 6mm glass | 6mm & 6mm glass | 3mm, 3mm & 3mm glass | 3mm & 3mm & 6mm glass |
| Window area as a percentage of total floor area of room or space 4 5 6 8 10 13 16 20 25 32 40 50 63 80 | | | | | | | | |
| 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 | 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 | 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 | | |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Notes to Table 3.3.A.

- (1) If the calculated percentage window area is not presented as a column heading, the nearest percentage column in the table should be used.
- (2) *Acoustic insulation factor* data listed in the table are for well-fitted weather stripped 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.
- (3) If the interpane spacing or glass thickness for a specific double-glazed window is not listed in the table, the nearest listed values should be used.
- (4) 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.
- (5) If the interpane spacings for a specific triple-glazed window are not listed in the table, use the listed combined spacings that are nearest the actual combined spacing.
- (6) The *acoustic insulation factor* data listed in the tables 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 test method E-90) are available, these may be used to calculate the *acoustic insulation factor*.
- (7) For easy reference, glazing dimensions may be written in the form 2(100) to denote 2 mm glass (100 mm space) 2 mm glass.

Winnipeg Airport Vicinity Development Plan

AREA I

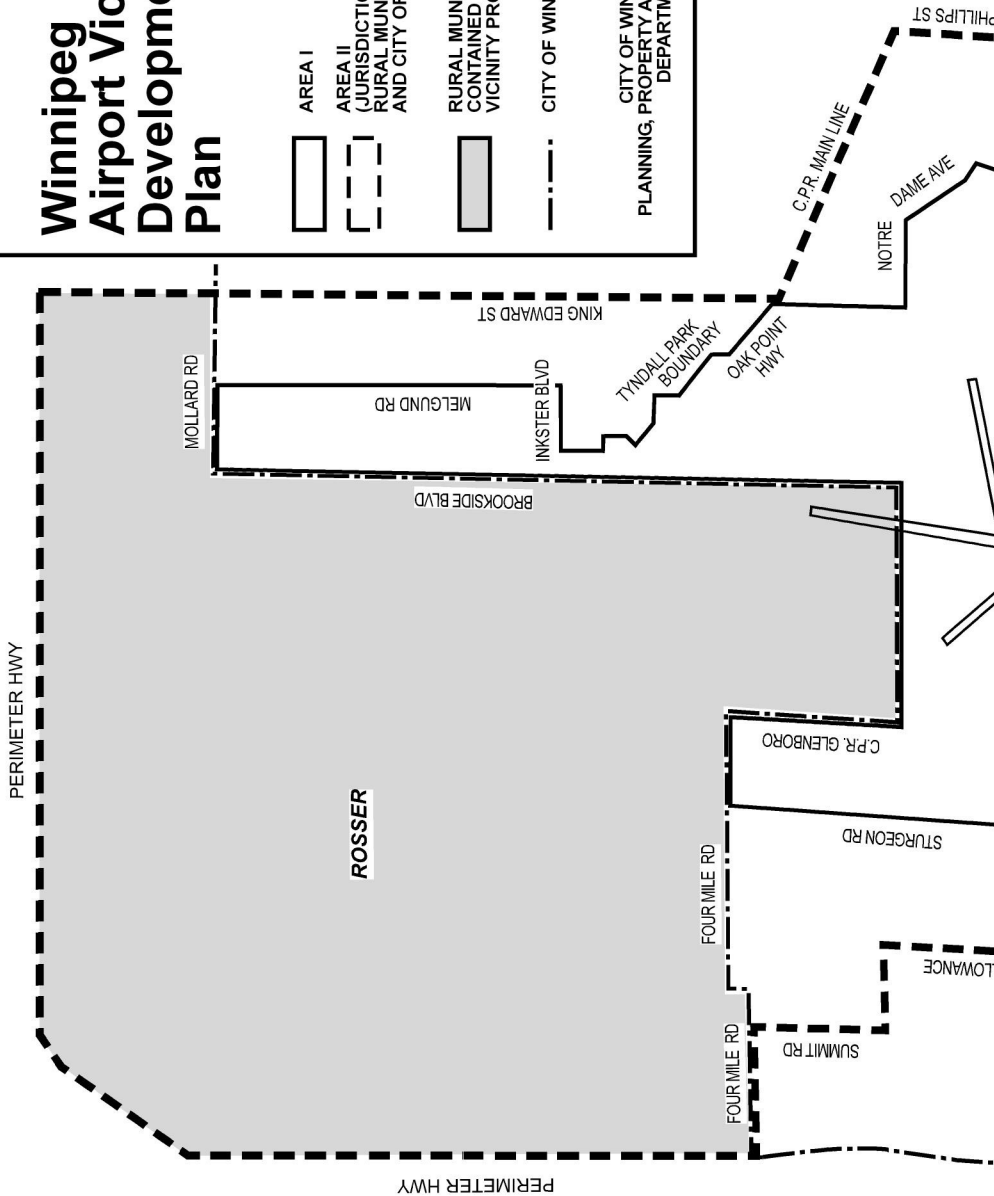
AREA II

JURISDICTION INCLUDES
 RURAL MUNICIPALITY OF ROSSER
 AND CITY OF WINNIPEG

RURAL MUNICIPALITY OF ROSSER
 CONTAINED WITHIN THE AIRPORT
 VICINITY PROTECTION AREA

CITY OF WINNIPEG BOUNDARY

CITY OF WINNIPEG
 PLANNING, PROPERTY AND DEVELOPMENT
 DEPARTMENT



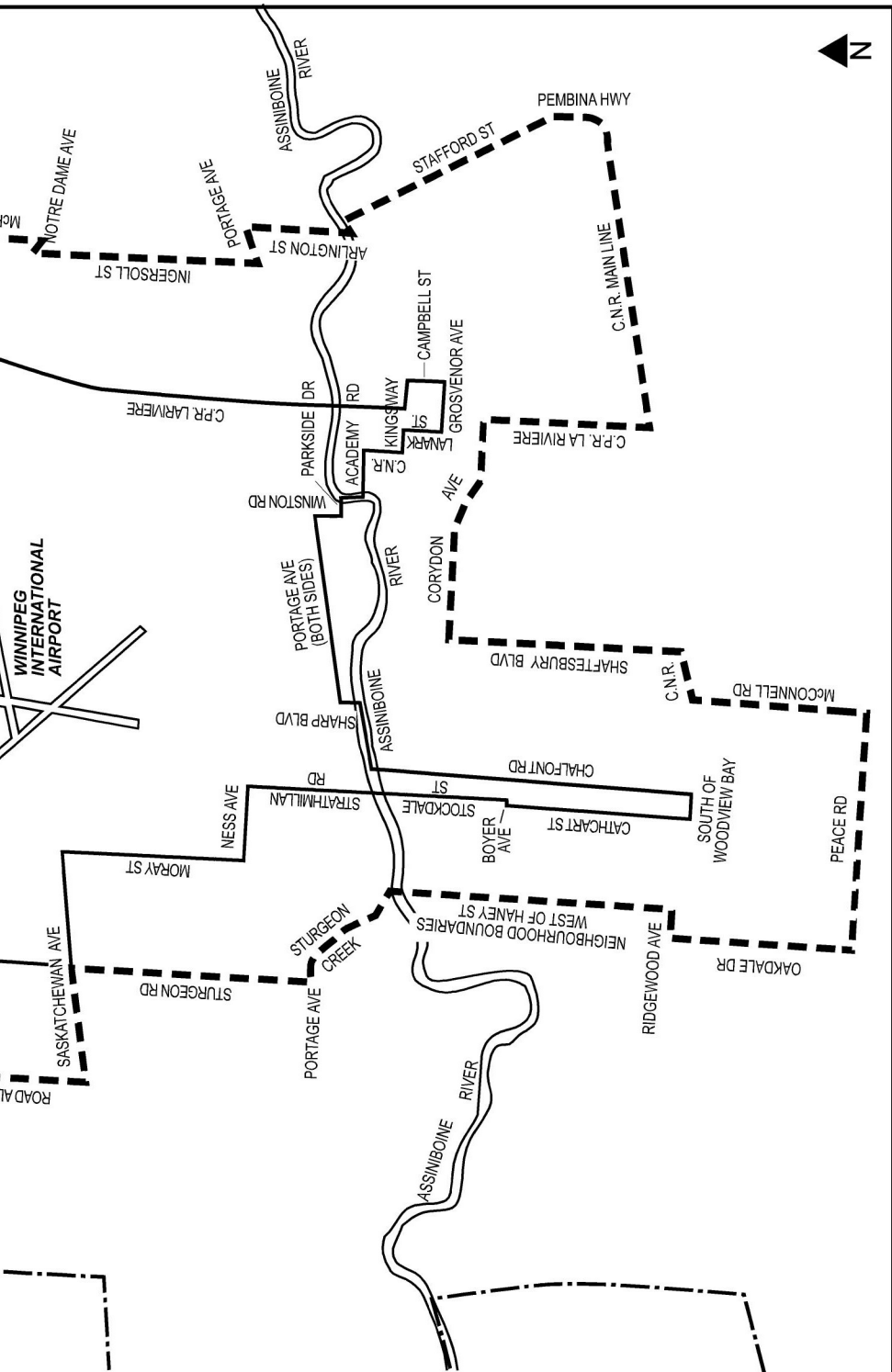


Table 3.3.8.
Forming Part of Article 3.3.1.

| Acoustic Insulation Factor for Exterior Wall Assemblies | | | | | | | | | | | |
|---|---|----|----|----|----|----|----|----|-----|-----|-----|
| Type of Exterior Wall | Percentage of exterior wall area to total floor area of room or space | | | | | | | | | | |
| | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| EW1 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 |
| EW2 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 |
| EW3 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 |
| EW4 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 |
| EW1R | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 |
| EW2R | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 |
| EW3R | 50 | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 |
| EW5 | 55 | 54 | 53 | 52 | 51 | 50 | 49 | 48 | 47 | 46 | 45 |
| EW4R | 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 | 48 | 47 | 46 |
| EW6 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 | 48 |
| EW7 OR EW5R | 59 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 |
| EW8 | 63 | 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 | 53 |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

Notes to Table 3.3.B.

- (1) If the calculated percentage of wall area is not presented as a column heading, the nearest percentage column in the table should be used.
- (2) The common structure of walls EW1 to EW5 is composed of 12.7 mm gypsum board, vapour barrier, and 38 x 89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in the inter-stud cavities.
- (3) EW1 denotes exterior wall as in Note (2), plus sheathing, plus wood siding or metal siding and fibre backer board.
EW2 denotes exterior wall as in Note (2), plus rigid insulation (25-50 mm), and wood siding or metal siding and fibre backer board.
EW3 denotes simulated mansard with structure as in Note (2), plus sheathing, 38 x 89 mm framing, sheathing, and asphalt roofing material.
EW4 denotes exterior wall as in Note (2), plus sheathing and 20 mm stucco.
EW5 denotes exterior wall as in Note (2), plus sheathing, 25 mm air space, 100 mm brick veneer.
EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 100 mm back-up block, 100 mm face brick.
EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 140 mm back-up block, 100 mm face brick.
EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 200 mm concrete.
- (4) R signifies the mounting of the interior gypsum board on resilient clips.
- (5) An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25-50 mm), 25 mm air space, and 100 mm brick veneer has the same *acoustic insulation factor* as EW6.
- (6) An exterior wall described in EW1 with the addition of rigid insulation (25-50 mm) between the sheathing and the external finish has the same *acoustic insulation factor* as EW2.

Table 3.3.C.
Forming Part of Article 3.3.1.

Acoustical Insulation Factor for Roof-Ceiling Assemblies

| Roof-Ceiling Combination | Acoustic Insulation Factor |
|--------------------------|----------------------------|
| C1 | 41 |
| C1R or C1D | 44 |
| C2 or C1DR | 47 |
| C3 | 49 |
| C2D | 50 |
| C2DR | 52 |
| Column 1 | 2 |

Notes to Table 3.3.C.

- (1) C1 denotes 12.7 mm gypsum board, 75 mm (or thicker) insulation batts, flat roof joist and beam construction, built-up roofing. C2 denotes, 12.7 mm gypsum board, 75 mm (or thicker) insulation batts, typical wood roof truss with ventilated attic, sheathing and asphalt roofing. C3 denotes paint finish, 150 mm concrete slab, 50 mm (or thicker) rigid insulation, built-up roofing.
- (2) D signifies the addition of a second layer of 12.7 mm gypsum board. R signifies mounting the gypsum board on wood strapping or resilient clips. DR signifies the addition of a second layer of 12.7 mm gypsum board mounted on resilient clips.
- (3) Wherever possible, ventilation openings to attic spaces should be in locations not directly exposed to aircraft noise.

Table 3.3.D.
Forming Part of Article 3.3.1.

Acoustic Insulation Factor for Exterior Doors

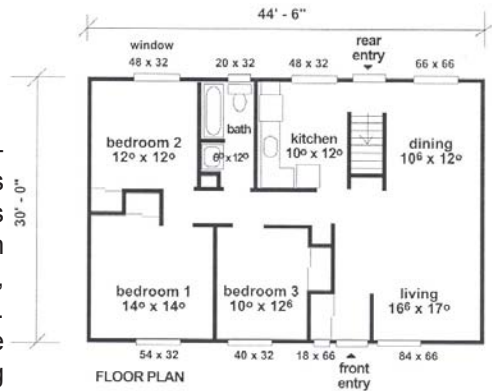
| Type of Exterior Door | Percentage of Total Exterior Door Area to Total Floor Area of Room or Space | | | | | | | | |
|-----------------------|---|----|-----|----|----|------|----|----|----|
| | 4 | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 20 | 25 |
| D1 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 |
| D2 | 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 |
| D5 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 |
| Column 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Notes to Table 3.3.D.

- (1) If the calculated percentage door area is not presented as a column heading, the nearest percentage column in the table should be used.
- (2) All exterior doors must be fully weatherstripped.
- (3) 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.
- (4) sd denotes storm door of wood or aluminium with openable glazed sections. The *acoustic insulation factor* values apply when the glazed sections are closed.
- (5) Except as noted specifically above, doors shall not have inset glazing.

Example:
A 3-bedroom bungalow

To determine the appropriate building components for this dwelling it is necessary to undertake calculations for the dining room, the living room, the kitchen, the three bedrooms, the bathroom and the basement. Two features of the dwelling require special consideration, the living room and dining room form one large room and the rear exterior door is adjacent to the doorways of both the kitchen and the dining room.



Building Location: NEF 33

Number of Components and Acoustic Insulation Factors:

Dining-living Room:

The calculation is made for the entire area as one room. The components are:

First component: windows, including the window in the front closet

Second component: Exterior walls, measured from the back of the front closet to the rear door.

Third component: the ceiling-roof.

Fourth component: the front and rear exterior doors.

Total number of components = 4. From Table 3.1.B: AIF = 34.

Kitchen:

Components are the window, exterior wall, ceiling-roof and rear exterior door

Total number of components = 4. From Table 3.1.C: AIF = 29.

Bedrooms 1, 2 and 3:

Each bedroom has three components — window, exterior wall and ceiling-roof.

From Table 3.1.A: AIF = 38.

Bathroom:

Three components — window, exterior wall and ceiling-roof.
From Table 3.1.C: AIF = 28.

Basement (Laundry/furnace):

Two components — window and exterior wall.
From Table 3.1.C.: AIF = 26.

Appropriate components

It is necessary at this stage to calculate the percentages of the total window area, total exterior door area and the net exposed exterior wall area. (i.e. excluding window and door areas) to the total floor area for each room. These percentages are:

| Room | % Window area to total floor area | % Exterior wall area to total floor area | % Exterior door area to total floor area |
|---------------|---|--|--|
| Dining-living | 19 ⁽¹⁾ | 87 | 9 ⁽²⁾ |
| Kitchen | 9 | 43 | 15 ⁽³⁾ |
| Bedroom 1 | 6 | 108 | - |
| Bedroom 2 | 8 | 126 | - |
| Bedroom 3 | 8 | 57 | - |
| Bathroom | 6 | 60 | - |
| Basement | 1 | 40 | - |

- Notes:
- (1) The window area includes the window in the front closet
 - (2) The total door area is the are of the front and rear exterior doors
 - (3) The total door area is the area of the rear exterior door only

AIF Adjustments

Living-Dining Room - AIF = 34 (4 components)

| Component | AIF | AIF minus AIF (req'd) | Increase in Transmitted Sound |
|------------------|-----|--------------------------|-------------------------------------|
| Ceiling-roof | 47 | +13 | -22% |
| Exterior wall | 40 | +6 | -19% |
| Windows | 30 | -4 | +38% |
| Doors | 34 | 0 | 0% |
| Overall increase | | = | -3% |

Bedroom 2 - AIF = 38 (3 components)

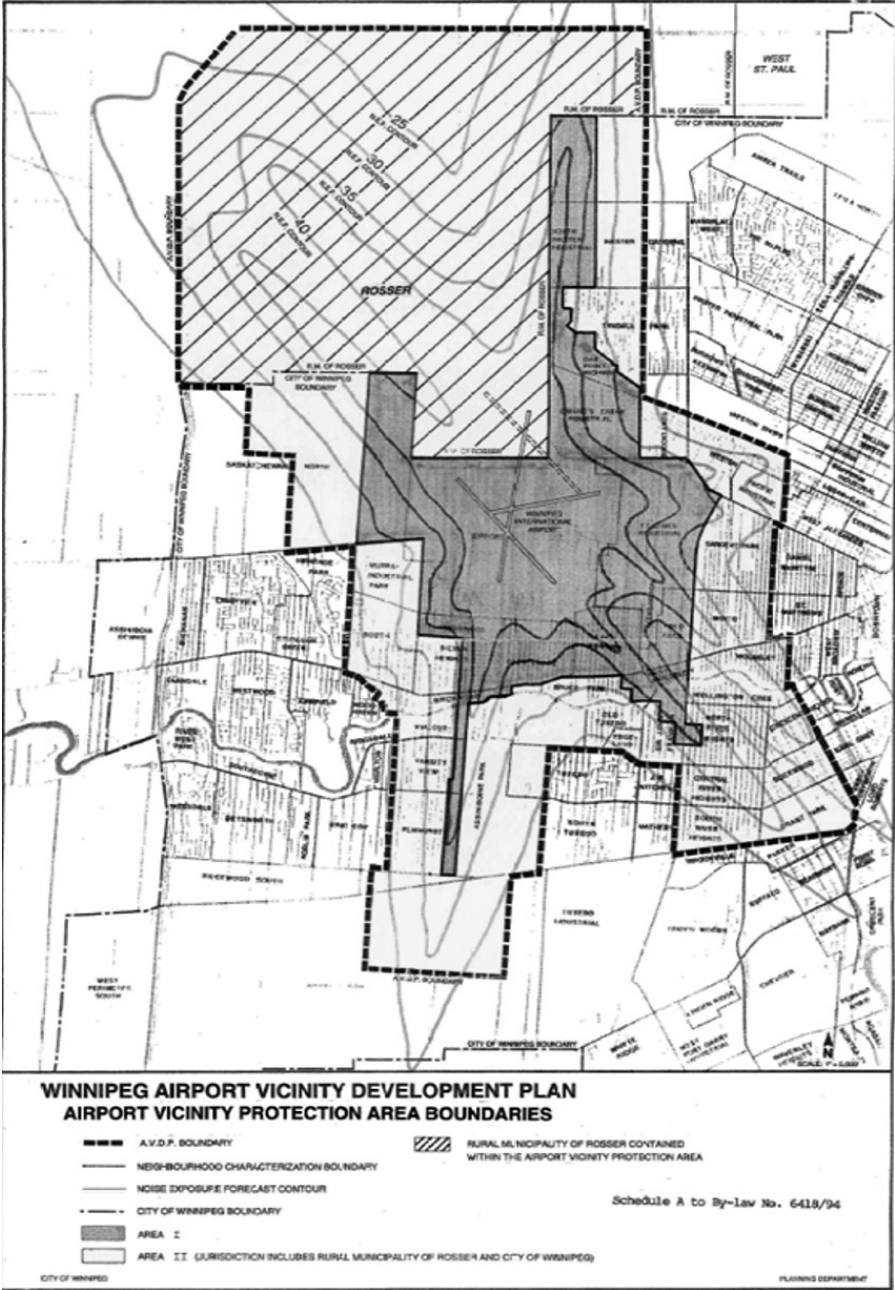
| Component | AIF | AIF minus AIF (req'd) | Increase in Transmitted Sound |
|------------------|-----|--------------------------|-------------------------------------|
| Ceiling-roof | 47 | +9 | -29% |
| Exterior wall | 38 | 0 | 0% |
| Windows | 36 | -2 | +20% |
| Overall increase | | = | -9% |

SUMMARY: Dwelling: A 3-bedroom bungalow

Building location: NEF 33

| Room | Dining- living | Kitchen | Bedroom 1 | Bedroom 2 | Bedroom 3 | Bathrm | Bsmt |
|----------------------------------|---------------------------|----------------|----------------------|----------------------|----------------------|---------------|-------------|
| No. of components | 4 | 4 | 3 | 3 | 3 | 3 | 2 |
| Acoustic Insulation Factor | 34 | 29 | 38 | 38 | 38 | 28 | 26 |
| % Window to floor area | 19 | 9 | 6 | 8 | 8 | 6 | 1 |
| % Exterior wall to floor area | 87 | 43 | 108 | 126 | 57 | 60 | 40 |
| % Exterior door to floor area | 9 | 15 | - | - | - | - | - |
| APPROPRIATE COMPONENTS | | | | | | | |
| Windows (Table 3.3.A.) | 3(6)3 | 2(6)2 | 3(13)3 | 3(16)3 | 3(13)3 | 2(6)2 | 2 |
| Exterior walls (Table 3.3.B.) | EW4 | EW4 | EW4 | EW4 | EW4 | EW4 | EW8 |
| Ceiling-roof (Table 3.3.C.) | C2 | C2 | C2 | C2 | C2 | C2 | |
| Exterior doors (Table 3.3.D.) | D1-sd | D1-sd | | | | | |

Schedule A



NOTES:



*For more information regarding this booklet
please contact:*

Zoning and Permits Branch

PH: 204-986-5140

FAX: 204-986-6347

Plan Examination Branch

PH: 204-986-5268

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or



***Winnipeg
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