

APPENDIX 1C
ACOUSTIC AND NOISE CONTROL RATINGS

**NEW WESTMINSTER
SECONDARY SCHOOL**

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This appendix will be read in conjunction with Appendix 1A Functional Program.

1. DEFINITIONS AND ACRONYMS

In this Appendix, in addition to the definitions set out in Schedule 1 of this Agreement:

- 1.1 ANSI – American National Standards Institute
- 1.2 ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers
- 1.3 ASME – American Society of Mechanical Engineers
- 1.4 ASTC – Apparent Sound Transmission Class
- 1.5 ASTM – American Society of Testing and Materials
- 1.6 BNL – Background Noise Level
- 1.7 “Confidential Privacy” rating is a level of speech privacy and is defined as follows: the sum of the composite STC and the A-weighted background noise level shall be at least 75.
- 1.8 dB – the Decibel is used to measure sound level.
- 1.9 dBA – A-Weighted sound pressure level
- 1.10 IIC – Impact Isolation Class
- 1.11 Leq – Energy average sound level
- 1.12 NC – Noise Criteria
- 1.13 NIC – Noise Isolation Class
- 1.14 NRC” means Noise Reduction Coefficient. NRC is a single number rating of the sound absorbing properties of a material – derived by arithmetically averaging the absorption coefficients at 250 Hz, 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz rounded to the nearest 5%. An NRC of 0.00 indicates zero absorption while; an NRC of 1.00 indicates 100% absorption.
- 1.15 RT60 – Reverberation Time (in seconds) is a measure to quantify the quality of room’s acoustic environment with respect to verbal communication and musical quality and it is the time required for the level of a steady sound to decay by 60 dB and expressed in seconds.
- 1.16 STC – Sound Transmission Class

2. ACOUSTIC SEPARATION DESIGN PRINCIPLES

The Design-Builder will:

- 2.1 Locate noise sources remotely from sensitive areas;
- 2.2 Isolate noise generated within the building at the source;
- 2.3 Isolate plumbing and mechanical noise from the building structure.

3. ACOUSTIC SEPARATION REQUIREMENTS

The Design-Builder will:

- 3.1 Provide adequate acoustic separation at the following locations:
- 3.2 Between areas of high noise generation and all other areas;
- 3.3 Between adjacent instruction, administration and office areas;

4. STC RATINGS

- 4.1 Walls and floors between the following spaces to meet or exceed performance of the STC value indicated;

1									
2									
3	65								
4	65	60	60	50					
5	65	53	60	60					
6	65	55	60	53	55	50			
7	65	53	66	53	60	50	53		
8	65	53	53	53	53	50	50	45	
9	65	55	60	50	55	45	50	45	
type	1	2	3	4	5	6	7	8	9

Space Types:

1. Not used
2. Mechanical and service rooms, Weight Room
3. Theatre*, Music*, Drama, Black box*, Dance*, Recording Studio,*
4. Learning Commons*
5. Gymnasium
6. Staff, administration and counselling offices
7. Instruction spaces (classrooms, home economics, science, computer, CTE shops)*
8. Circulation spaces*, general storage, washrooms, custodial rooms,
9. Administration, general office, counseling office

* refers to spaces that STC rating minimums apply to the walls (excluding doors and windows). In all other cases, the STC rating applies to the composite construction including the doors and windows.

4.2 STC rating of 43 between:

- 4.2.1 Classrooms and Art studios, where moveable walls are incorporated;
- 4.2.2 Classroom and secondary corridor to Collaborative Learning Spaces where glazed walls are required.

5. ACOUSTIC TREATMENT REQUIREMENTS

- 5.1 Provide appropriate materials including acoustic wall panels, ceilings and decking to provide acceptable acoustic condition for the following areas;
- 5.1.1 Theatre: to be suitable for theatrical/musical performance and school meeting and assemblies;
 - 5.1.2 Gymnasium: to be suitable for meetings, assemblies and athletic events;
 - 5.1.3 Music: to be suitable for musical instruction, rehearsal and recording;
 - 5.1.4 Music practice rooms: to be suitable for rehearsal;
 - 5.1.5 Recording Studios: to be suitable for recording.
- 5.2 In general, the Design-Builder to provide:
- 5.2.1 Absorptive and reflective material to instruction spaces to provide acceptable acoustic conditions for instruction;
 - 5.2.2 Acoustic treatment to have appropriate impact and wear resistant for each intended location.

6. REVERBERATION TIME (RT)

Maximum Reverberation to Time to meet or exceed performance indicated below:

Room type	Maximum unoccupied reverberation time (seconds)
Recording Rooms/Studio	0.3-0.4
Theatre	0.8-1.0
Black box	0.8-1.0
Band Room	0.6
Offices	0.7
Instructional spaces - 250 m ³ volume or less	0.6
Instructional spaces - 250 to 500 m ³	0.7
Band/ Music instruction	0.8
Learning Commons	0.8
Open plan office areas	0.8
Choir	0.8-0.9
Gymnasium	1.5

7. BACKGROUND NOISE LEVEL (BNL)

- 7.1 Background noise is comprised of noise from building systems, exterior sound transmission, and sound transmission from adjacent spaces. Excessive background noise can seriously degrade the ability to communicate. The background noise level limits are for unoccupied and furnished space.
- 7.2 For learning spaces with internal volumes of 250 m³ or less, one-hour steady-state background noise levels should not exceed 35 dBA.
- 7.3 For learning spaces with internal volumes of 250 m³ or more, one-hour steady-state background noise levels should not exceed 40 dBA.

8. ACOUSTIC DOORS

- 8.1 For music doors, provide metal doors with glazing windows that achieve STC 57 or appropriately rated doors with perimeter sealing separated by a sound lock vestibule treated with sound absorption. Vestibule doors to be solid core wood doors with STC 30 with perimeter sound seal as per section 6.6.6.2(11)(a) of Schedule 1 Statement of Requirements regarding STC 30 glazed window. Such vestibules shall:
 - 8.1.1 Provide maneuverability requirements (including door sizes wide enough) that are sufficient for moving large equipment;
 - 8.1.2 Ensure spatial layout is adequate; and
 - 8.1.3 Achieve required acoustic ratings.