Part 1 General

1.1 Summary

.1 Unless otherwise indicated, follow the guidelines below when planning for classrooms in new or renovated spaces. These guidelines are not intended to restrict or replace professional judgment.

.2 This document can also guide planning of University Teaching Laboratories, in conjunction with McGill's Building Design Standards for Laboratories (see **Special Building Areas – Laboratories**).

.3 These guidelines shall be read jointly with other relevant McGill Standards including (but not limited to):

.1 Furniture
https://www.mcgill.ca/buildings/furniture-standards

.2 Signage
https://www.mcgill.ca/buildings/signage-standards

.3 Accessibility
https://mcgill.ca/buildings/files/buildings/accessibility_on_campuses_5.pdf

.4 These guidelines shall be read with the specific technical sections of McGill's Building Design and Technical Standards mentioned in Part 3. – Related Technical Sections.

1.2 Scope

.1 The purpose of this section is to provide classroom spaces to the McGill community that encourage learning, promote interaction and enrich educational experiences while respecting the operational needs of the building in which these spaces are located.

.2 This document provides principled guidelines for classroom design, construction and/or renovation of formal learning spaces.

.3 This document also outlines considerations for spaces that connect and support formal learning spaces such as halls, corridors and informal spaces.

1.3 Strategic Life Cycle

.1 All McGill University classrooms shall be designed and built for a 30-year life-cycle.

1.4 Vision

.1 University classrooms shall support collaboration, promote communication and enrich educational experiences with innovative designs that are adaptable, sustainable and encourage equity.

.2 University classrooms shall support the "*Principles for Designing Teaching and Learning Spaces"* adopted by McGill University's Teaching and Learning Services Working Group (TLSWG) and detailed in the TLSWG companion document "McGill University Classroom Guidelines and Standards", dated June 2019.

https://www.mcgill.ca/tls/files/tls/mcgill_university_classroom_guidelines_and_standards_june_17_2019.pdf

1.5 Guiding Principles

.1 Active and collaborative learning

.1 Design should promote flexible and adaptable environments that allow for the natural transition to alternative and more collaborative teaching models and promote the shift from traditional, lecture-style teaching.

.2 Classrooms should have the ability to readily accommodate reconfigurations and other changes, and to permit a variety of uses.

.3 Classrooms should incorporate features that allow students to actively engage with content and collaborate with one another.

.2 Student-faculty interaction

.1 Design should reduce physical distance and barriers to facilitate equitable exchanges between students and faculty members in the classroom and promote the shift from the conventional hierarchy.

.2 Classroom layouts should allow for easy circulation and provide clear sightlines between students, faculty members and content.

.3 The acoustics of the classroom should promote communication and support productive exchange.

.3 Enriching educational experiences

.1 Classrooms should include a range of technologies and features that supports multiple modes of teaching and learning. Such technologies should support instructor as well as student sharing of multiple information sources.

.2 Technologies should accommodate various options and platforms for sharing information.

.3 Technologies and resources should allow peers to connect within the physical classroom as well as virtually.

.4 Room controls should be user-friendly and standardized for all classrooms.

.4 Supportive campus environment

.1 Classrooms should provide a livable environment as defined by the following points:

.1 The aesthetics of classrooms should be alluring and engaging.

.2 Classrooms should provide multiple furniture options to accommodate variability and preferences of the users. Furniture choices should harmonize with the built space to create comfortable, flexible and adaptable environments.

.3 Lighting should be adequate and easily adaptable to support all classroom activities.

.4 Adequate ventilation, high indoor air quality, thermal comfort and an appropriate level of relative humidity should be provided.

.5 Sufficient and suitable storage should be provided for individual belongings and classroom materials.

.6 Classrooms should provide a safe environment and encourage equity, personal preferences and limitations.

.2 Promote sustainability

.1 Design should be developed with sustainability in mind, through the choice of materials, building practices and technologies.

.2 Classrooms should be easily adaptable to new uses with minimal intervention.

.3 Implement strategies that will minimize the environmental footprint of classrooms.

.5 Ownership and Governance

.1 The use of classrooms is made available to all faculties of the McGill community, and is not exclusive to a faculty or to a building in which a classroom is located. To this goal, all classroom projects that receive funding from the University are centrally scheduled and adhere to the Provost's Policy on Open Access, where applicable:

"When the University puts funds into any computer lab, the lab will conform to general log in practices of the university (e.g., any student can access email or Library). Rooms can be booked for specific pedagogical purposes, such as instruction, or special projects. They cannot be restricted to specific groups at specific times."

– Provost Anthony Masi, Jan 11, 2008

.2 The Teaching and Learning Services Working Group (TLSWG) acts on behalf of the University and is therefore considered the client representative for classroom projects. The main users of the spaces (faculty members and students) are also important stakeholders in the process, and their voices are essential to the success of classroom projects.

1.6 Codes and Standards

.1 The existing laws, regulations, standards and reference documents govern the design of classrooms:

.1 B-1.1 – Building Act

.2 B-1.1, r.2 – Construction Code

.3 B-1.1, r.3 – Safety Code

.4 NFPA 101 – Life Safety Code

.5 ANSI/ASA S12.60-2010/Part 1 - Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools

.2 The following best practices standards shall be applied to the design of classrooms:

.1 Learning Space Rating System (LSRS), Version 2, updated February 2017.

.2 LEED v4

.3 WELL v2

1.7 Planning Considerations

.1 General

.1 These guidelines shall be taken into consideration when planning new classrooms in newly constructed facilities and in major reconstruction of existing buildings.

.2 For re-designs, alterations, retrofits, and renovations of existing facilities, the client has determined the space allocated for a classroom renovation project. A number of classroom standards rely on base building elements (e.g. windows for light and views, sound isolation properties of an existing building envelope, etc.) and are therefore not attainable for every project.

.3 It is the responsibility of the professional nonetheless to advise the client of base building elements that may be problematic for the success of a classroom. The professional shall propose realistic solutions to mitigate existing inadequacies of the room with the intent of adhering to the Guiding Principles.

.2 Location of Classrooms

.1 Classroom location and function shall take into account other existing or planned classrooms on the floor, in the building, and in the sector.

.2 Classrooms shall be located within easy access from the main entrance of the building, preferably on the lower floors.

.3 Wherever applicable, classrooms shall be located to avoid heavy student traffic passing through office areas. Adequate acoustic separation shall be considered when gathering spaces are located immediately adjacent to classrooms.

.4 Provide natural light and views to exteriors for classrooms wherever possible.

.5 Locate informal learning spaces next to formal learning spaces.

.6 Miscellaneous noise sources such as vending machines, restrooms and drinking fountains shall be located not to interfere with classroom background noise.

.7 In new construction, rooms with high floor-impact activity that may generate vibration shall not be located above classrooms. In renovations, every effort shall be made to avoid locating classrooms below rooms with high floor-impact activities. Conversely, consideration shall be given to the relocation of high-impact floor activity rooms located above planned classrooms.

.8 Exterior noise environment factors shall be taken into consideration.

.9 The composition of the building shell (i.e. composite STC ratings of exterior walls with windows) shall be taken into consideration.

.3 Room Geometry

.1 Proportion: optimal length-to-width ratio shall not be greater than 1.5:1 for classrooms with one primary orientation. Rooms with greater ratios shall be remedied through layout possibilities that use those proportions advantageously, i.e. multiple and centre-focused orientations.

.2 Sight lines of visibility: provide unobstructed views for all participants to see the teacher, to see one another and to see information on displays. Avoid or minimize impact of base building obstructions – e.g. existing structural columns and low ceilings – that will affect sight lines. In classrooms with one primary orientation, consider addition of viewing screens.

.3 Proximity: configure room proportions to ensure the shortest distance between the teacher and student and to optimize interactions among and between participants.

.4 Screen Viewing Parameters

.1 Refer to **Annex 1** for Screen Viewing Parameter diagrams.

.2 The screen viewing limitations are intended to be used as a rule-of-thumb to establish optimal areas for viewing, and therefore for seating. The classroom footprint may be wider and deeper to accommodate circulation and other functions.

.3 Design for best viewing of projection screens while taking into consideration writing surfaces and teacher positions (includes, but not limited to, podium location).

.4 For interactive displays, installation height shall adhere to the standards for writable surfaces. Refer to paragraph 2.3.4 of this document.

.5 Classroom Typology

.1 Matrix

Furniture **Floor Level**	**Movable**	**Combination**	**Fixed**
Single - Flat	**Preferred configuration** <u>Promotes:</u> *Flexibility* *Collaboration* *Accessibility* *Sustainability*	Fixed furniture allows for greater capacity	Not applicable
Room Orientation	**One or multiple**	**Multiple**	
Layout Options	Rows Group work Seminar	Group work	
Furniture options	Tables and chairs Tablet chairs	Fixed group work tables with movable chairs Fixed furniture, movable tables and chairs	
Multiple - Tiered	New construction since requires adequate floor area to achieve	Retrofit projects with existing tiers where existing room conditions do not allow for other solutions and for larger rooms with increased capacity	**Least flexible configuration** Retrofit projects with existing tiers where existing room conditions do not allow for other solutions and for auditoriums with high capacity
Room Orientation	**Multiple**	**One**	**One**
Layout Options	Group work	Rows Group work	Rows
Furniture options	Tables and chairs Tablet chairs	Fixed tables (rows or group work) with movable chairs	Fixed tablet chairs

.2 Flat vs Tiered Floor Level

.1 Classrooms that are flat with movable furniture are preferred to promote:

.1 Flexibility

.2 Collaboration

.3 Accessibility

.4 Sustainability

.2 Classrooms that are tiered with fixed furniture are the least flexible, therefore are the least preferred. Classroom of this type may be necessary:

.1 For retrofit projects with existing tiers

.2 When a classroom's existing conditions do not allow for other solutions

.3 For auditoria and large classrooms with high capacity

.3 Layout options

.1 Row configuration implies that the room is set up in rows. Students are faced towards the main room display (one-orientation rooms). The teacher and the room display are often the focus. This layout allows for some collaboration with students sitting side-by side.

.2 Group work configuration implies that multiple students are facing each other. Material may be projected on multiple displays. This configuration allows for full collaboration between students, and between the students and the teacher.

.3 Seminar configuration implies that chairs are set up in a circle or horseshoe shape, or tables are set up in a boardroom or 'U' shape. The displays are not the focus of this figuration, although material may be projected on multiple displays around the room. This configuration allows large groups to collaborate.

.4 For optimal flexibility, classrooms shall have multiple layout options whenever possible

.4 Classroom orientation

.1 One orientation implies that the main room displays (for technology) are on one wall, although other walls may have displays. Often, the podium placement is associated with this main wall.

.2 Multiple orientations imply that multiple walls have displays and they are all equally important. Although the podium placement may be associated with one wall, the location of the podium is less critical.

.3 For tiered classrooms with one orientation, every effort shall be made to increase collaboration by integrating elements such as:

.1 Group work tables

.2 Large table or tablet surfaces

.3 Two or multiple rows per tier; multiple rows shall be even numbered to ensure equitable collaboration for all students

1.8 Accessibility

.1 Classrooms shall follow McGill's Standards for Accessibility on Campuses.

.2 As a compendium to furniture standards prescribed in this document, Universal Design accommodations for a wide range of disability barriers shall be considered for classroom

tables and chairs, in addition to those prescribed by the Construction Code, the Safety Code and McGill's Standards for Accessibility on Campuses. These accommodations may contradict standard tenets for flexibility. In consultation with the client, the users and Design Services, the professional shall ascertain whether a classroom could benefit from additional accommodations that promote greater diversity and inclusion:

.1 Adjustable height tables vs standard height;
.2 Seating without casters vs seating with casters;
.3 Variety of seating vs uniform seating;
.4 Seating with armrests vs seating without armrests;
.5 Seating with increased width and weight capacity vs standard size seating.

.3 Podium placement shall take into consideration the minimum turning diameter of 1500mm between the podium and the adjacent wall. For newly constructed facilities or wherever attainable and reasonable, follow the follow McGill's Standards for Accessibility on Campuses for the prescribed or optimal turning diameters.

1.9 Sustainability

.1 Whenever possible, concepts and strategies for sustainability shall be integrated in the classroom design.

.2 Architectural strategies shall be implemented wherever possible in anticipation of future changes in technology and classroom usage. Some strategies to be considered:

.1 Demountable, modular wall systems (wherever acoustic requirements will allow);
.2 Architectural detailing allowing for easier removal of wall elements;
.3 Strapping or backing in new walls for installation of future wall elements;
.4 Avoid built-in audiovisual equipment and writing surfaces for easier replacement (as AV and IT equipment have a shorter lifespan as compared to architectural, mechanical and electrical components).

Part 2 Design Standards

2.1 Design Concept and Thematic Coherence

.1 For each classroom project, a design concept shall be developed:

.1 Significant to teaching of the specific classroom
.2 Thematically connected to the user
.3 Architecturally related to the building in which it is located
.4 To (subtly) differentiate the classroom from other classrooms

.2 Ensure the thematic coherence of the classroom design concept to the adjacent spaces on the floor and to the architecture of the building through the choice of materials, finishes, colours, graphic identity and style.

.3 Classrooms shall be designed to be aesthetically pleasing, stimulating and culturally inclusive atmospheres to promote engagement in learning activities.

.4 Identify and connect group work tables to displays and writing surfaces through the use of colours, graphics, lighting and materials.

.5 Strategically use colours and patterns on flooring surfaces and in the choice of furniture (chair colour, table surfaces, edging and finishes) to differentiate between different types of furniture and to help in the placement of movable furniture for different layouts.

2.2 Architectural Elements

.1 Walls

.1 In keeping with the Strategic Life Cycle goals for classrooms, special attention shall be given to detailing and resilience of surfaces, to anticipate minimizing damages due to non-fixed seats and furniture, winter and rain gear, and general student use.

.2 To ensure durability, notably in rooms with movable furniture, specify impact-resistant materials and finishing for the lower part of the wall. Consider materials and finishes related to the room aesthetic.

.2 Doors, Frames & Hardware

.1 Doors and hardware specifications shall take into consideration access and security, acoustics, and accessibility.

.2 Standard solid wood doors and frames with standard door hardware sets for classrooms shall be specified for entry doors to classrooms.

.3 Door assemblies shall adhere to the sound isolation requirements specified in **section 2.5.6.**

.4 Door assemblies to classrooms shall include sidelights or vision panels in the doors. For acoustic reasons, sidelights are preferred over door glazing wherever possible.

.3 Interior Windows

.1 Provide visual connections between adjacent but physically separate spaces to enable exposure and visibility of learning activities.

.2 Acoustic window assemblies shall achieve the acoustical objectives of this standard.

.3 The use of motorized interior blinds on sidelights and interior windows may be required, dependant on the specific requirements of the classroom.

.4 Ceiling

.1 Refer to **section 2.5.5** of this document for acoustical design strategies.

.2 To facilitate access to equipment in the ceiling spaces, suspended ceilings shall be specified for classrooms.

.3 Exposed ceilings may be considered where appropriate and for thematic coherence with the building. In the absence of a suspended ceiling, ensure an adequate acoustical design strategy that responds to the objectives of this standard.

.4 Where a portion of the ceiling is required to be reflective for acoustical reasons, other reflective materials related to the room aesthetic may be considered. Ensure that required access to all ceiling equipment is maintained.

.5 Flooring

.1 Linoleum is the preferred flooring material due to its low environmental impact and in keeping with the Strategic Life Cycle goals for classrooms.

.2 For impact noise attenuation, cork underlay may be added to achieve impact sound reduction.

.3 Raised flooring systems may be considered where appropriate to allow for greater flexibility and future adaptability.

.4 Flooring design is considered an affordance (rather than just an aesthetic choice) in classrooms with movable furniture and multiple layouts. Flooring shall be conceived to guide in the placement of movable furniture for multiple layouts through differences of colours and patterns.

2.3 Furniture and Accessories

.1 General

.1 Refer to the catalogues in the McGill Furniture Standards when choosing and specifying the following types of classroom furniture:

.1 Standard Classroom Furniture

.2 Informal and Collaborative Furniture

.3 Architectural partitions

.2 Furniture for auditorium seating and custom tables shall be chosen or designed on a case-by-case basis.

.3 Custom furniture specified to accommodate particular requirements or existing room conditions shall use standard materials, surfaces, edges and construction.

.2 Configuration and Flexibility

.1 Enable easy movement within space to support communication and facilitate interaction: ensure layouts provide ample space between furniture.

.2 Seating Density:

.1 Optimal – for classrooms in new construction: 2.3m^2 per student

.2 Prescribed – for retrofit projects: 2m^2 per student

.3 Minimum – code requirement

.3 Level of flexibility to obtain will depend on program, room capacity, types of adjacent classrooms available, etc. Furniture possibilities include:

.1 Movable tables and chairs

.2 Fixed tables and movable chairs

.3 Tablet chairs (movable or fixed)

.4 Informal typology: combination of various furniture from the classroom and informal furniture collections. Examples of informal furniture include lounge seating, banquettes, media hubs, personal tables, etc.

.4 Ensure all furniture is accounted for when planning for various layout scenarios with the same furniture:

.1 If less furniture is required for a layout option, ensure storage area is available or plan for dedicated place in classroom for storing unused furniture

.2 Consider flip-top tables if a layout requires less tables

.3 Consider stackable or nesting chairs if a layout requires less chairs

.5 Design with sightlines in mind so that students see other students. Some examples include:

.1 Angled rows (curved or ‘v’ instead of straight)

.2 Two rows or multiple (even-numbered) rows on a tier

.3 Central podium (multidirectional)

.6 Furniture Height

.1 Variable height working surfaces (with corresponding seating) within the same classroom shall be considered:
.1 To accommodate a range of heights and postures
.2 To ensure clear sightlines in larger rooms (i.e. higher furniture in the back of a flat classroom with one orientation acts as artificial tiers).
.2 Standard height for tables is 735mm; counter height for tables is 915mm; bar height for tables is 1065mm.
.3 Examples include tables with fixed legs of different heights, tables with adjustable height legs and adjustable height seating.
.4 To support inclusion in group work when specifying various height furniture in a classroom, ensure an adequate number of standard height tables to provide the accessible spaces required as per the Accessibility Standards.

.7 Diverse Furniture Types
.1 To promote a range of activities, and to support equity, personal preferences and limitations, classroom designs shall consider incorporating diverse seating and table types within a single classroom.
.2 Examples include adjustable height chairs, tables with adjustable height legs, active movement chairs, lounge-type furniture, etc.

.8 Diverse Patterns of Use
.1 Where a classroom is designed as a multipurpose space for activities outside of classroom hours, e.g. for exhibitions or events, consider:
.1 Movable furniture
.2 Flip-top tables
.3 Stacking/nesting chairs
.4 Location of electrical outlets and lighting to allow for flexibility

.3 Work surfaces

.1 Standard surfaces shall be specified for furniture from the Standard Classroom Furniture Catalogue.
.2 Work surfaces shall be large enough for notebooks, laptops and textbooks:
.1 Width per person: 760mm
.2 Table depth
.1 Optimal: 610mm
.2 Prescribed: 510mm
.3 Minimum: 460mm
.3 Tablet size
.1 For movable tablet chairs, see Standard Classroom Furniture Catalogue.
.2 For auditorium seating
.1 Optimal: 560mm x 410mm
.2 Minimum: 410mm x 305mm

.4 Writable surfaces

.1 General
.1 Dimensions: 1220mm height minimum; length dependent on room configuration

.2 Height of installation: 815mm – 865mm from finished floor

.2 Whiteboards of porcelain enamel-coated steel is the preferred writable surface in keeping with the Strategic Life Cycle goals for classrooms.

.3 Whiteboards are preferred over back-painted glass for the main writable surfaces used for teaching.

.4 Back-painted glass is permitted for secondary writable surfaces used for collaboration; ensure lighting is appropriate to avoid glare.

.5 Seams between panels:

.1 Specify maximum horizontal panel lengths to ensure minimum seams between panels

.2 Where applicable, ensure all joints are concealed

.6 When planning group work furniture configurations, ensure that each group has a writable surface for team collaboration. If wall space is limited, provide additional mobile whiteboards for additional surfaces and flexibility of layout.

.7 Accessories (markers, erasers, cleaning fluid, etc.) shall be supplied with initial project

.5 Physical storage

.1 Provide storage within classrooms for instructor/student belongings, equipment, or furnishings. Storage strategies are to be determined on a case-by-case basis. Solutions may include:

.1 Hooks at strategic locations, and at different, appropriate heights for bags and coats

.2 Book baskets beneath seating

.3 Hooks beneath tables

.2 When security is an issue, consider lockable storage.

.3 Consider placement of additional furniture components and accessories when not in use.

.4 Consider the ease of manipulation of furniture when changing classroom layouts. When useful to accelerate the transformation, provide additional furniture components to store extra furnishings. Some examples include:

.1 Storage carts for stackable chairs

.2 Storage carts for mobile writing surfaces

2.4 Signage

.1 All signage shall be specified by McGill's Design Services.

.2 Classroom layout signs help in the placement of movable furniture for different layouts. Allow wall space for two classroom layout signs of 300mm x 460mm for installation at eye level near the main entrance of each classroom.

.3 Furniture labels are required for all movable furniture (tables, chairs, mobile whiteboards, etc.)

.4 Seating labels are required for auditorium seating.

2.5 Environment

.1 General

.1 The intent of the classroom guidelines below is to connect certain aspects of the building services with their relevance and importance to classroom design.

.2 Air

.1 Follow McGill's Building Design Standards for Heating, Ventilation and Air Conditioning.

.2 Ensure cleanability of classrooms for improved air quality through choice of materials and attention to detailing: flooring, wall and furniture finishes; smooth welds and joints, free of crevices and hard-to reach places; right angles between walls; windows and floors are properly sealed; adequate storage for movable furniture to be completely cleared during cleaning.

.3 Daylight

.1 Consider daylight wherever possible to support learning and improve concentration and engagement.

.2 Daylight is achieved directly through windows to the exterior, or indirectly through windows into corridors or spaces that have access to direct daylight.

.3 Motorized blinds shall be specified for exterior windows in all classrooms, to be connected to the lighting controls.

.4 Artificial light

.1 Follow McGill's Building Design Standards for Lighting.

.2 Flexibility:

.1 Ensure optimal flexibility of lighting control appropriate to different learning activities.

.2 Provide different lighting patterns to support multiple types of teaching tasks.

.3 Ensure dimming capability.

.4 Establish and coordinate lighting zones and dimming scenes and in conjunction with Teaching and Learning Services Working Group (client), the main users of the space (faculty and students) and McGill's IT Services (AV).

.3 Electric light glare control:

.1 Minimize direct glare by setting limits on the luminous intensity of light fixtures.

.2 Consider position of light fixtures with respect to writing surfaces to avoid glare.

.5 Room Acoustics

.1 General:

.1 Ensure the effective acoustic design of the room to enable occupants to hear presenters, audio content and one another.

.2 Background noise shall not interfere with the purpose of the room.

.3 Room acoustics shall support productive exchange.

.4 Ensure that appropriate amplification is available in conjunction with McGill's IT Services.

.2 Reverberation Time:

.1 Follow ANSI/ASA S12.60-2010/Part 1 recommendations for maximum permitted reverberation time for sound pressure levels in octave bands with midband frequencies of 500, 1000 and 2000 Hz (s):

.1 0.6 seconds for classrooms with enclosed volume $\leqslant$ 283 m^3

.2 0.7 seconds for classrooms with enclosed volume > 283 m^3

.3 Recommended Noise Criteria / Sound Levels

.1 Follow ANSI/ASA S12.60-2010/Part 1 recommendations for noise criteria (NC) level / equivalent sound level maximum (dBA) for internally generated background noise levels from building services and utilities:

.1 NC-25 / 35 dBA for classrooms

.2 NC-30 / 40 dBA for ancillary spaces

.2 The measured NC curve on site after construction completion shall not exceed 3 units of the recommended design criteria (NC-25 design guidelines should measure NC-28 maximum on a site after construction is complete) for classrooms in new buildings. Retrofit projects in existing buildings, shall be subjected to special background noise adjustments to compensate for existing base building limitations.

.4 Acoustical Design Strategies

.1 Traditional acoustical design for classrooms with one primary orientation:

.1 Sound reflecting surfaces at the front close to the sound source (teacher) angled toward the back of the audience;

.2 Porous absorbing materials installed on the back wall, the back portion of the ceiling and on the side walls;

.3 Sound reflecting ceiling angled towards the back of the audience to complement the direct sounds from the sound source.

.2 Listening conditions also applies to flexible (multiple orientation) classrooms without specific sound sources and receivers' orientation.

.3 The majority of classrooms require amplified audio and instructor microphones, and some may require student microphones. Although room acoustics strategies for classrooms are primarily for unamplified speech, the room acoustics shall take into account audio distribution systems.

.4 Sound absorption panels and compositions shall have a minimum NRC (noise reduction coefficient) rating of 0.85 for ceiling and vertical surfaces.

.5 For noise control of the mechanical systems, noise-reducing strategies may include lower conduit air speed, silencers and vibration control devices.

.5 For the accessibility requirements of amplified sound, refer to the Construction Code.

.6 Sound Privacy & Noise Isolation

.1 General

.1 Ensure the reduction of noise that intrudes into the classroom from sources outside the boundaries of the classroom from the following sources:

.1 Indoor to indoor attenuation of airborne sound

.2 Outdoor to indoor attenuation of airborne sound

.3 Structure-borne impact sound isolation

.2 Indoor to indoor attenuation of airborne sound

.1 Follow ANSI/ASA S12.60-2010/Part 1 recommendations for Sound Transmission Class (STC) minimum ratings for wall and floor-ceiling assemblies that separate a core learning space from an adjacent space:

.1 Adjacent classroom – 50

.2 Corridor – 45

.3 Washroom – 53

.4 Mechanical room, music/performance room, cafeteria – 60

.5 Office, conference room, or any room requiring a high degree of acoustical privacy – 50

.2 In no case shall the design STC between classrooms and adjacent spaces be less than 45.

.3 All penetrations in sound-rated partitions shall be sealed and treated as necessary to achieve the required STC rating.

.4 Interior door assemblies and sidelights of up to $1m^2$ shall have an STC rating of 30 or greater in their operable conditions.

.5 Doors into music rooms located within 9m of a door to a classroom shall have an STC rating of 40. A vestibule entry (airlock) composed of two sets of doors with STC ratings of 30 or greater shall be considered to conform to the STC 40 requirement.

.3 Outdoor to indoor attenuation of airborne sound

.1 Classrooms in new construction shall be designed to conform to a minimum Outdoor-Indoor Transmission Class (OITC) dependant on the outdoor sound noise level as specified in ANSI/ASA S12.60-2010/Part 1.

.4 Structure-borne impact sound isolation

.1 Follow ANSI/ASA S12.60-2010/Part 1 recommendations for Impact Isolation Class (IIC) minimum ratings for floor-ceiling assemblies that separate classrooms from occupied rooms above:

.1 45 for formal learning spaces

.2 40 for informal learning spaces

.2 Where rooms with high floor-impact activity that may generate vibration are located above classrooms, the IIC rating shall be minimum:

.1 70 for classrooms

.2 65 for auditoria

.3 65 for informal spaces

.7 Electrical Power

.1 Follow McGill's Building Design Standards for Electricity.

.2 Provide sufficient power outlets for students, to be determined as a function of:

.1 Existing electrical capacity in the building

.2 User requirements

.3 Energy Management

.3 Options for distribution of power includes:

.1 Raised floor system

.2 Power distribution

.3 Distributable power sources

2.6 Technology & Infrastructure

.1 General

.1 Classroom requirements for audiovisual and telecommunication services shall be defined by the client in collaboration with McGill's IT Services.

.2 Audiovisual design choices have an important impact to classroom design and shall be considered in the project validation or conceptual phase of the project (depending on the mandate). AV design may change the room design as AV needs are developed.

.3 Audiovisual equipment for classrooms typically includes (but is not limited to) podiums and the equipment housed within, projectors, projection screens or video displays, and loudspeakers. Classrooms may require additional equipment strategically placed to accommodate various systems including videoconferencing, web conferencing, Lecture Recording Systems (LRS), other local recording systems. Lighting design shall satisfy the specific requirements of each AV system incorporated.

.4 TLS currently supports University initiatives such MOOCs (Massive Open Online Courses) and Online Learning. The spatial impact that these initiatives may have on classroom design shall be considered.

.2 Telecommunication Services

.1 Conduits for all telecommunication services shall be included in the electrical scope of work. Telecommunication services include AV, data, communication and network, emergency communication and emergency alarms.

.2 McGill's IT Services shall identify the telecommunications room or closet from which those services are to originate for a given classroom.

.3 The professionals shall be responsible for the coordination of all required services for the classroom including telecommunications room and AV rack. Due to the complexity of the existing conditions of many of McGill's buildings, determining the path of conduits from that telecom room or closet to the classroom's AV rack or podium shall be considered as early as possible in the design process.

.3 Podiums

.1 McGill's IT Services shall specify all standard podiums for classrooms.

.2 The architect shall specify the colours and finishes.

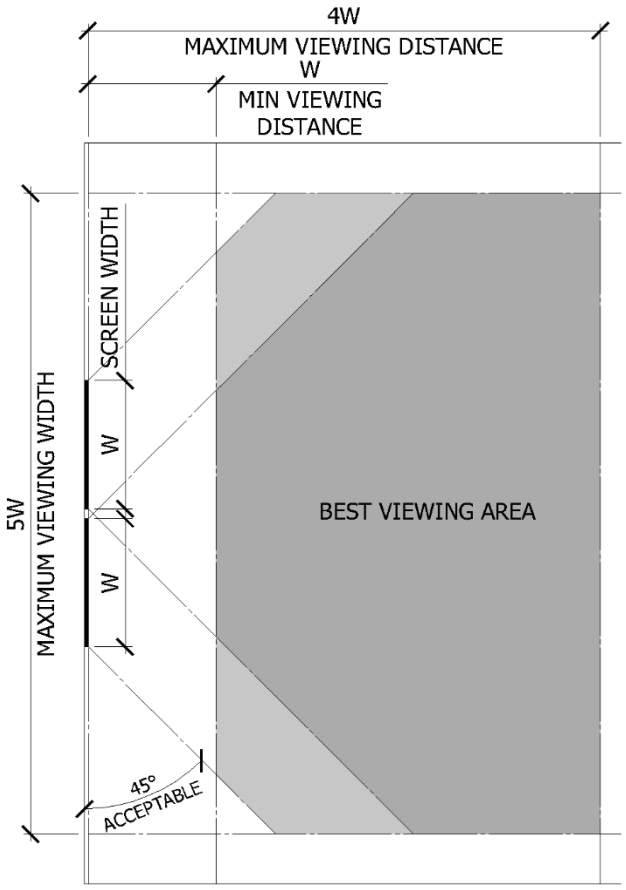
.3 The placement of the podium shall be coordinated with McGill's IT Services.

Part 3 **Related Technical Sections**

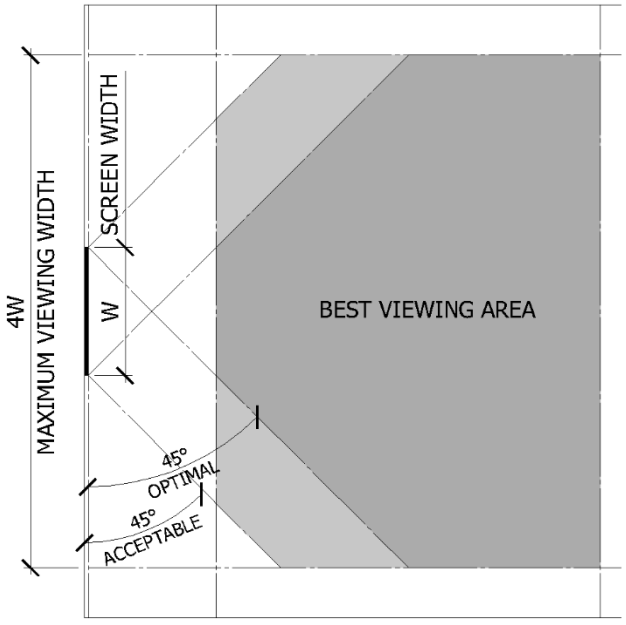
The technical sections of the McGill Building Design and Technical Standards shall be consulted with the current document, most notably (but not limited) to the following:

Section Number	Title of Section
00 20 00	Instruction to Consultants
01 81 13	Sustainable Design Requirements
01 84 19	Interior Finishes Performance Requirements
06 40 00	Architectural Woodwork
08 11 14	Metal Doors and Frames
08 14 10	Interior Flush Wood Doors
08 71 10	Hardware
09 22 27	Suspended Ceiling
09 65 16	Resilient Sheet Flooring
09 65 19	Resilient Tile Flooring
09 84 10	Acoustic Treatment
09 91 26	Painting
10 11 00	Visual Display Board
12 50 10	Podiums
12 51 30	Window coverings
23 00 00	Heating Ventilation and Air Conditioning
26 00 00	Electricity
26 50 00	Lighting
Division 27	Communications (in progress)

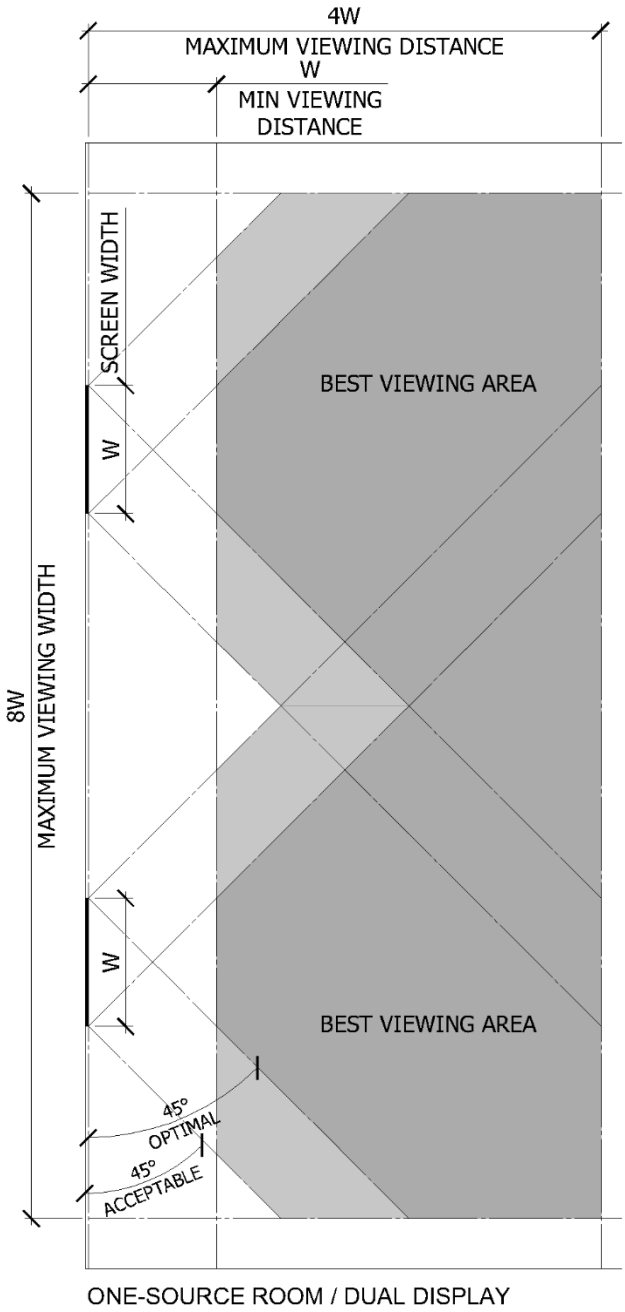
END OF SECTION



TWO-SOURCE ROOM

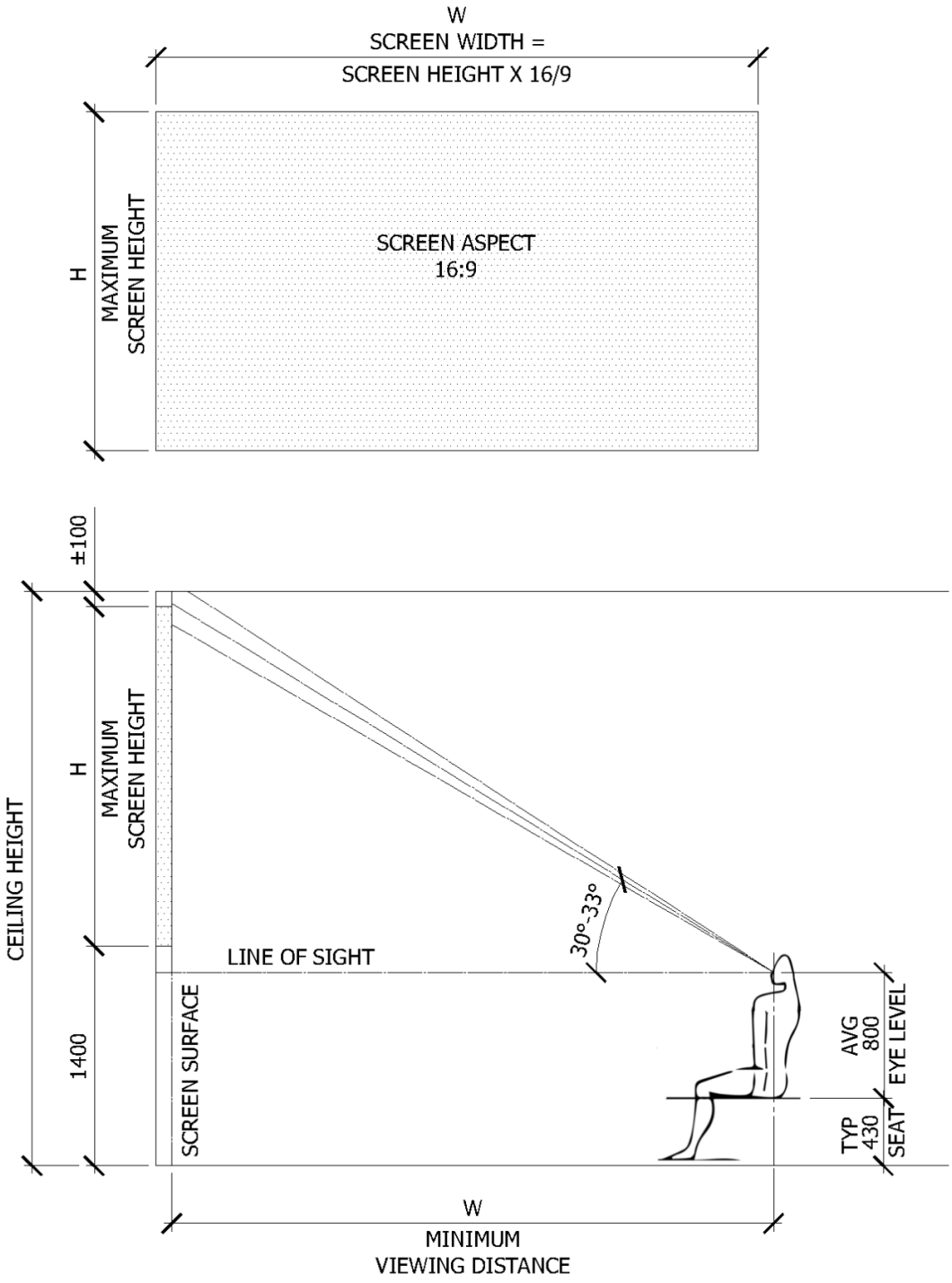


ONE-SOURCE ROOM



ONE-SOURCE ROOM / DUAL DISPLAY

SCREEN VIEWING PARAMETERS
VIEWING AREA LIMITATIONS
PLAN



SCREEN VIEWING PARAMETERS
SCREEN ASPECT AND
MINIMUM VIEWING DISTANCE
SECTION & ELEVATION