



McGill

Facilities Development
University Services
840 Doctor Penfield Avenue, 4th floor
Montreal, Quebec H3A 1A4

BUILDING DESIGN STANDARDS

McGill University

September 2009



DIVISION 00- INSTRUCTIONS

00 00 01 Table of Contents

DIVISION 0 – INSTRUCTIONS TO CONSULTANTS

	pages
00 00 01 Table of contents	3
00 10 00 Introduction	4
00 20 00 Instructions to consultants	6
00 20 10 McGill Cad Protocol	6
00 20 11 McGill drawings numbering protocol	2
00 30 00 Other McGill standards	2

DIVISION 1 – GENERAL REQUIREMENTS

01 02 01 Design requirements for special building area	5
01 02 02 Roofing Materials Cutting & Patching	2
01 56 00 Temporary Barriers and enclosure	1
01 74 21 Construction/Demolition Waste Management and Disposal	4

DIVISION 2 – EXISTING CONDITIONS

02 01 01 Tree Preservation	2
02 41 16 Selective site demolition	2
02 82 10 Asbestos Abatement	1

DIVISION 3 – CONCRETE

03 05 10 Concrete	2
-------------------	---

DIVISION 4 – MASONRY

04 05 10 Common work for masonry	2
----------------------------------	---

DIVISION 5 – METALS

05 50 00 Metal Fabrication	2
----------------------------	---

DIVISION 6 – WOOD

06 10 10 Rough Carpentry	1
06 20 00 Architectural Woodwork	3

DIVISION 7 – THERMAL & MOISTURE PROTECTION

07 52 00 Roofing	4
07 84 00 Fire-stopping	2
07 92 10 Joint sealing	2

DIVISION 8 – DOORS AND OPENINGS

08 03 11 Historic –Period wood doors	2
--------------------------------------	---



00 00 01 Table of Contents

08 11 14	Metal Doors & Frames	3
08 11 16	Aluminum Doors & Frames	1
08 14 10	Flush wood doors	2
08 33 36	Side Folding Grilles	1
08 35 14	Accordion Folding Doors	2
08 35 15	Acoustic Folding Doors	2
08 50 50	Windows	4
08 71 10	Hardware	10
08 80 50	Glazing	1

DIVISION 9 – FINISHES

09 21 16	Gypsum Board Assemblies	2
09 22 27	Suspended Ceiling	2
09 30 13	Ceramic Tiling	1
09 65 16	Resilient Sheet Flooring	2
09 65 19	Resilient Tile Flooring	2
09 68 00	Carpet	2
09 84 10	Acoustic Treatment	1
09 91 26	Painting	6

DIVISION 10 – SPECIALTIES

10 11 00	Visual Display Board	2
10 14 24	Building Panel Signage	2
10 21 20	Solid Plastic Toilet Partitions	1
10 28 10	Toilet and Bath Accessories	3

DIVISION 12 – FURNISHING

12 35 54	Laboratory Casework	2
12 48 20	Foot grilles	3
12 51 30	Window covering	2

DIVISION 14 –CONVEYING EQUIPMENT

14 21 23	Elevators	2
----------	-----------	---

DIVISION 21 – FIRE SUPPRESSION

21 13 10	Portable fire extinguishers and fire hoses	2
21 13 13	Wet Pipe Sprinkler System	3

DIVISION 22 – PLUMBING

22 00 00	Plumbing	6
----------	----------	---



DIVISION 00- INSTRUCTIONS

00 00 01 Table of Contents

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

23 00 00	Heating, Ventilating and Air conditioning	6
23 11 23	Laboratory piping for gases	1
23 38 17	Chemical fume hood	2

DIVISION 25 – INTEGRATED AUTOMATION

25 00 00	Integrated Automation	2
----------	-----------------------	---

DIVISION 26 – ELECTRICAL

26 05 01	Common Works Results - Electrical	3
26 50 00	Lighting	5

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 31 01	Fire Alarm System	9
----------	-------------------	---

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 37 00	Exterior site Furnishing	2
----------	--------------------------	---

END OF SECTION 00 00 01



00 10 00 Introduction

Part 1 General

1.1 Introduction to McGill University Design Standards

.1 Introduction

This document contains Design Standards for the design and construction of facilities at McGill University. The Design Standards are to be used by all design professionals (architects, engineers) in the preparation of construction documents for any new construction or renovation project. The purpose of the Design Standards is to assure maximum quality and value in construction projects at McGill University, through uniformity, system or component quality, compatibility, functionality, and ease of maintenance. These Design Standards are intended to provide general direction to design professionals as a general rule for most circumstances. These Design Standards do not replace professional design analyses. We expect the design professional to conduct independent evaluations for each project. They are not intended to relieve the designers and contractors from their responsibility to comply with applicable codes and other contract obligations.

.2 Design Standards

This document contains Design Standards for the design and construction of facilities at McGill University. It is to be used by all Architects/Engineers in the preparation of construction documents (plans and specs) for any new construction or renovation project. This means that these Standards are NOT CONTRACT SPECIFICATIONS. They only address aspects of equipment or systems about which we have concerns or a desire to standardize. Properly written specifications will be much broader in scope and more detailed. Throughout this document reference is made to the Architect/Engineer's contact with the University as the University Project Manager. This title is not meant to imply any one singular person, but rather any one of a number of people who may be assigned to the project.

.3 Zoning Compliance

Any design work that affects the exterior envelope of a building, the demolition of a building or the construction of new building or addition may impact on City of Montreal Zoning. Elements of zoning include building height, site density, site coverage, building setback, etc. and breaching any of these regulations will likely require the University to proceed into a lengthy derogation process. The designer must ensure that any interventions undertaken do not unwittingly trigger derogations to both by-Law 95-039 which governs McGill and the local borough zoning bylaw(s). This may occur even within general upgrade work (e.g. setbacks for mechanical equipment). Where and when unsure, the project manager should consult with Brian Karasick - Planning and Institutional Analysis) before submitting any requests to the City.



00 10 00 Introduction

.4 Change Indication:

Where a technical change or addition to the September 2008 edition has been made, the requirements affected are indicated by a vertical line in the margin. No indication is provided where requirements have been renumbered or deleted. Revisions to existing chapters of the standards should follow the same format. All requests for revision should be sent electronically to the Director of design Services.

1.2 Compatibility with Existing Conditions

.1 Existing Conditions

The Architect/Engineer must visit the site prior to start of design to determine existing conditions of architectural and mechanical systems. The design must be based upon the actual conditions, not initial design specifications. If upgrading of the central system is necessary to meet the needs, this information shall be given to the Project manager who will coordinate with Facilities Operations.

.2 Utility Services

The use of central utilities rather than stand-alone systems is encouraged. The Architect/Engineer must closely communicate with the University early in the design phase of the project to determine the best probable points of connection to central services. The Director, Mechanical and Electrical Services will approve sources prior to schematic design.

.3 Utility Capacity

As part of schematic design, the Architect/Engineer must demonstrate that the project under design will not adversely affect utility availability for other spaces, nor utilize inordinate amounts of future capacity for all utilities. Provision is to be made for other planned consumers when a utility is upgraded.

Determination of capacity must be made early enough for funds to be allocated within the renovation project (prior to schematic design estimate if possible).

.4 Integrity of Separations

All (existing and new) openings in fire and acoustical separations are to be patched at end of the project with the same fire rating and sound criteria as the adjacent separation.

1.3 Owner's Options

.1 General



00 10 00 Introduction

The University requires that specific vendor's products be used in many cases to assure job quality through reliability, ease of maintenance, manufacturer's proven maintenance and warranty support, and control of stock.

Even so, the University is always looking for better, less expensive systems and components of comparable or higher quality. Accordingly, the Contractor may submit alternates, to be revised by the professional and the owner in order to be accepted as equivalent. However, in doing so it is the responsibility of the manufacturer to demonstrate to the University's satisfaction that equivalency of quality/reliability in fact exists. McGill reserves the right to accept or refuse any manufacturer, supplier or distributor. **Use of the phrase "or equal" or "or equivalent" after any specific manufacturer's product identification is to be avoided, rather use "OR APPROVED EQUIVALENT".**

1.4 Owner's Review

- .1 The Architect/Engineer's design documents will undergo Owner's reviews during the design phases of a project. The Owner's reviewers may include (but are not limited to) the Project Manager, Design Manager, User Groups, Fire Protection Officers, Architectural and Engineering Services, Building Services, Maintenance, and Grounds Management. The Project Manager will coordinate the Owner's review activities.

An Owner's review is a comprehensive examination of a project's design documents to evaluate if the design generally meets the Owner's requirements. The Owner's reviews shall not serve as the Architect/Engineer's design, drafting, or coordination checks. **The documents shall be coordinated and checked by the Architect/Engineer before being submitted to the University.**

1.5 Execution

- .1 When the Architect/Engineer submits the design documents to McGill University, the Project Manager will distribute them for review. Comments received by the Project Manager will be sent to the A/E for resolution.

The Architect/Engineer shall:

- Request clarification of any comment that is not fully understood.
- Discuss with the Project Manager any comment that will significantly affect the project's schedule or budget.
- Update the next revision of the design documents in accordance with the A/E responses.



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DIVISION 00- INSTRUCTIONS

00 10 00

Introduction

END OF SECTION 00 10 00



00 20 00 Instructions to consultants

Part 1 General

1.1 General Instructions

- .1 For each project, McGill University Facilities Management & Development will assign a Project Manager. All communication with the University, from the design period through the construction period, will be done through the Project Manager.
- .2 The floor plans of University buildings are available in AutoCAD format. Mechanical and electrical plans are, most often, in paper format. These plans are for reference and general planning only; for detailed design, on-site inspections are always required. These inspections are part of the basic contract of the Consultants. In the event that a detailed survey is required, it will be completed by an external group.
- .3 The Project Manager must pre-approve all work, which will require extra cost.
- .4 All plans and specifications must conform to McGill Building Design Standards (this document), available from the office of Facilities Management & Development. The Project Manager must authorize any deviation from the standards.
- .5 The McGill project number should appear on all documents, and in all correspondence.
- .6 In the event of a change to the plan asked for by the client, the Project Manager must be notified, in writing, before obtaining permission to continue.
- .7 When further investigations are required on-site, the following procedures should be followed:
 - .1 Consult existing drawings and specifications to make sure that the needed information is not to be found on them.
 - .2 Locate the site at which work must be done.
 - .3 Inform the Project Manager, by way of mail, the requirements of the project.
- .8 If the presence of asbestos is suspected on-site, a request for further investigation must be sent by way of e-mail, to the Project Manager. (See section 02-82-10 Asbestos Abatement)
- .9 Final drawings must be verified and returned to the Project Manager within the next five working days following the approval meeting with the users and consultants.

1.2 Specific Requirements

1.3 Participants

- .1 Participants:
-



00 20 00 Instructions to consultants

- .1 Owner: McGill University (Royal Institution for the Advancement of Learning)
- .2 Project Manager: member of the technical staff of the Department of McGill University Facilities Management & Development, assigned to the project for its duration.
- .3 Client: member of the research, teaching, or administrative staff of the University, main recipient of the project's benefits
- .4 Consultant: expert advisor hired by the Owner.

1.4 Useful Addresses

- .1 Telephone numbers and mailing addresses for McGill staff:
<http://www.mcgill.ca/directory>
- .2 McGill University Contractual documents (including General Conditions):
<http://www.is.mcgill.ca/phyres/Docs.htm>
- .3 Interactive map of Downtown campus:
<http://www.mcgill.ca/maps>
- .4 Access to floor plans for McGill buildings in AutoCAD format:
Contact Mr. Stanley Glavac by sending email request to stanley.glavac@mcgill.ca, at the Planning and Institutional Analysis Office
- .5 For research pertaining to archives, contact Mr. Ronald MacDonald (ronald.macdonald@mcgill.ca), at the office of Facilities Management & Development.

1.5 Codes

- .1 All of the applicable building code and standards listed below are to be followed. In case of discrepancies the most restrictive item will apply:
 - .1 Construction Code (latest version in effect)

1.6 McGill Sustainable Design Standards

- .1 McGill University shall strive to be recognized as an environmentally safe and responsible institution of learning, and as a model of environmentally responsible living. To this end, the McGill University community shall make every reasonable effort to:
 - .1 Prevent the over consumption of energy and other resources and reduce the production of waste, and the releases of substances harmful to the biosphere;
 - .2 Maintain purchasing policies which favour environmentally-benign, post-consumer, bio-degradable, and non-toxic products wherever possible;
 - .3 Encourage all members of the McGill community to be environmentally aware and the University's Environmental Policy to be well publicized;



00 20 00 Instructions to consultants

- .4 Encourage all members of the McGill community to Re-think/Reduce/Re-use/Recycle. Given the costs that recycling entails, reduce and re-use options shall always be considered first; and
- .5 Seek additional ways of achieving our goal of being environmentally safe and responsible.
- .2 Prior to beginning Schematic Design, A/E shall clarify the design objectives with respect to sustainable design, in conjunction with the McGill University Design Manager. As design progresses, McGill University standard practice items should be incorporated, and additional potential items should be raised for discussion and evaluation. It is the University's expectation that items that require little or no additional cost to the project will be included in the design, unless a reason is identified why this is impractical.

1.7 Protected Buildings and Spaces

Some University buildings have been identified as buildings requiring historic preservation. For detailed information, the consultants must refer to:
<http://www.mcgill.ca/pia/spacedata/propertylist/>

- .1 If a building is identified as protected, the Project Manager must be informed and the proposal for alterations must be reviewed by the Architectural Advisory Committee.

1.8 Construction Documents

- .1 Construction Document Production

It is preferred that Architects/Engineers create and edit their drawings with 'Autodesk' AutoCAD 2007 (or greater) software using McGill's layers and drawing number format. Alternately, they may use their own layer and numbering systems but must then supply McGill with the relevant CTB's (Plot Style Table) and fonts. All relevant Xref's and image files must be included when transmitting drawings. Xref's must be attached using a "relative path" setup. See sections 00 20 10 and 00 20 11 for McGill CAD protocol. (Feb.2009 – Design Team)

- .2 Minimum Drawing Requirements

The following drawing standards are required for all design work done for the University.

- .1 Drawings shall be printed on bond paper.
- .2 Standard sheet sizes are 11 inches wide by 17 inches long or 24 inches wide by 36 inches long. Other drawing sizes require the approval of the University Project Manager. It is the responsibility of the Architect to determine the size of drawings and coordinate with other consultants.
- .3 Symbols/references:
 - .1 Include complete index to drawings on 1st or 2nd sheet of the entire set. When sheets are added or deleted during the course of construction, final Record drawing set shall have the index updated to reflect the final documents.



00 20 00 Instructions to consultants

- .2 Scale shall be indicated by note on each applicable drawing, detail, and section. Any numbers or letters associated with the scale bar are to be a minimum 1/8-inch high. Where scale is applicable for entire drawing, scale references are to be located in the title block.
- .3 Plan sheets shall have north arrows, and all plans shall be consistent in their north arrow orientation.
- .4 Where a portion of a plan or elevation appears on a sheet, a key plan shall be provided in the lower right portion of the drawing area to show the location of that portion relative to the whole.
- .5 Cross-reference all plans, elevations, sections, and details as applicable.
- .6 Equipment and structural load capacities shall be listed on drawings.**
- .7 Drawings shall clearly distinguish between existing, new, and replacement work.
- .8 The building occupancy classification as per Quebec Construction Code shall be listed on drawings.**
- .4 Title Block Content
 - .1 The University will identify the Project Title and project number, which the A/E shall put on each drawing.
 - .2 Sheet title shall be as descriptive as possible, shall always be unique within the drawing set.
 - .3 When submitting to the University any sheet with information not previously submitted, a note shall be included on one of the issuance lines on the title block, indicating purpose of submittal and date. This applies to design review and contract issuances as well as addenda, bulletins, etc. All such notations of issue shall remain on each sheet. In addition to the note on the issuance line, sheets, which have already been released for bids, shall have changes clearly delineated, by "clouding" or similar means.
 - .4 The title block, located at the lower right corner of the sheet shall contain the following information:
 - .1 McGill University building number and building name
 - .2 McGill University project number
 - .3 Project title
 - .4 Sheet title
 - .5 All plans, specifications and reports shall be sealed by the Architect and/or Engineer responsible for the work, as required by law.
- .3 Specifications
 - .1 The general requirements (Division 1) and technical portions (Divisions 2 through 28) of the specifications may be included on drawings, or in book (project manual) form. Generally, projects with anticipated construction costs of more than 1 million dollars



00 20 00 Instructions to consultants

- are required to take the project manual approach. Consult with University Project Manager.
 - .2 On small projects, produce specifications on drawings as follows:
 - .1 Arrange Division 1 general requirements and Division 2 through 14 technical specifications at the End of Architectural trade drawings.
 - .2 Arrange Division 21 technical specifications at the end of fire suppression trade drawings
 - .3 Arrange Divisions 22, 23, 25 technical specifications at the end of mechanical trade drawings.
 - .4 Arrange Divisions 26, 27, 28 technical specifications at the end of electrical trade drawings.
 - .3 Specification Standard: The University recommends compliance with the principles and practices outlined in the NMS Manual of Practice.
 - .4 Use the current version NMS Section numbers and titles for organizing Documents and specifications within Project Manuals. Comply with guidelines for contents of each Division and Section of the specifications.
 - .4 Language of documents
 - .1 Plans and specifications must be written in French. The minutes of design meeting must be written in English. The minutes of construction meeting must be written either in French or in English.
 - .2 Eliminate the term "by others" from drawings and specifications. If work is not part of the Contract, say so directly using (N.I.C.) or similar constructions.
 - .5 McGill University Standard General Conditions
 - .1 The University maintains its own Standard General Conditions. Obtain a copy of this document and make sure the specification writer is fully familiar with it.
 - .2 In general, Supplemental Conditions are not required. However an Architect/Engineer may wish to modify language concerning shop drawing review or other items. Coordinate use of supplemental conditions with the Project Manager.
- 1.9 Coordination**
- .1 General:
 - .1 All work in ceiling spaces, mechanical rooms, reflected ceiling plans, etc. shall be coordinated to provide maximum accessibility. Consider additional drawing sections or extraordinary construction measures to assure this. Pay particular attention to this when the user and/or other design staff have consciously decided to install mechanical equipment in marginally accessible locations.
 - .2 Keep maximum height under ceilings: new ceilings should not be lower than existing ceilings. Efforts have to be made by all parties to coordinate services over ceilings in order to maximise space and not lower ceilings uselessly.



00 20 00 Instructions to consultants

- .2 Drawing Requirements:
- .1 The Architect/Engineer must place notes on the drawings, as appropriate, directing the Contractors to coordinate all work to allow free access to mechanical and electrical equipment for servicing. Drawings must include access to panels, doors, service entrances, etc. existing or new. Architectural plans must incorporate access panels and other mechanical equipment that will appear as a finish product in the space. The removal of other components such as light fixtures in order to service any equipment shall be discouraged. The specifications should require that the General Contractor, for major renovation and new construction projects, submit the coordination drawings. These drawings shall clearly show the priority by trade required to assure access to the equipment and devices in the ceiling cavity. Of particular importance is the free access to all variable volume boxes, reheat coils and their controls—including free and easy removal of the entire box. Nothing shall be located beneath these devices. (Fire protection or other piping is to be offset around the device footprint, etc.) The Architect/Engineer must witness the construction to assure that the required accessibility is achieved.
 - .2 Any design work that affects the exterior envelope of a building, the addition of new or modification of existing openings, or changes to the type, finish or color of exterior materials (including roofs), must also comply with *City of Montreal* regulations. As the McGill campus is mostly located within the 'Arondissement historique et naturel de Mont Royal', approval may also be required from the *Ministry of Culture of Quebec*. While there is no set guideline for what is or is not permitted, the choices and decisions on design and materials must be made in the context of the building in question and its immediate context. The project may be sent to the *City's internal architectural review committee* once the approvals process is undertaken. Unless there is a zoning element affected, there is no need to consult with *Planning and Institutional Analysis*. However, the project manager should consult with *Architectural Advisory Committee (AAC)* and obtain the necessary approval from this group before submitting any such requests to the City.

FIN DU DOCUMENT 00 20 00



00 20 10

McGill CAD Protocol (Refer to Section 00 20 00, article 1.9)

<u>Layer</u>	<u>Description</u>	<u>L type</u>	<u>Color</u>	<u>Line width(mm)</u>
Architectural (existing)				
AE-Axis	Axis lines	Center	10	0.09
AE-Ceil	Reflected ceiling grid	Cont.	17	0.09
AE-Ceil-Txt	Reflected ceiling text	Cont.	7	0.15
AE-Ceil-Dim	Reflected ceiling dimensions	Cont.	7	0.15
AE-Det-Txt	Detail text	Cont.	7	0.15
AE-Det-Bold	Details Bold Lines	Cont.	4	0.50
AE-Det-Fine	Details Fine Lines	Cont.	161	0.15
AE-Det-XFin	Details Extra Fine Lines	Cont.	165	0.09
AE-Dim	Dimension lines	Cont.	7	0.15
AE-Doors	Doors and frames	Cont.	9	0.09
AE-Floor	Flooring (raised, tiles, etc.)	Cont.	9	0.09
AE-Furn	Furniture	Cont.	1	0.09
AE-Furn-Dim	Furniture Dimensions	Cont.	7	0.15
AE-Furn-Mob	Mobile Furniture (Chairs Desks etc...)	Cont.	12	0.09
AE-Furn-Txt	Furniture Text	Cont.	7	0.15
AE-Hatch	Hatching	Cont.	8	0.09
AE-Lab	Lab furniture	Cont.	1	0.09
AE-Library	Library stacks, lockers, shelving	Cont.	1	0.09
AE-Part	Partitions	Cont.	5	0.09
AE-Room	Room number	Cont.	7	0.15
AE-Shelves	Shelves	Hidden 2	12	0.09
AE-Site	Exterior landscaping	Cont.	5	0.09
AE-Stairs	Stairs, elevators, ramp, platforms, etc.	Cont.	9	0.09
AE-Struc	Structural walls and columns	Cont.	13	0.09
AE-Txt	General drawing text	Cont.	7	0.15
AE-Windows	Windows	Cont.	9	0.09
Architectural (demolition)				
AD-Axis	Axis Lines	Hidden		0.15
AD-Ceil	Reflected ceiling	Hidden	37	0.25
AD-Ceil-Txt	Reflected ceiling text	Cont.	31	0.25
AD-Ceil-Dim	Reflected ceiling dimensions	Cont.	31	0.25
AD-Ceil_Hatch	Ceiling hatches	Cont.	8	
AD-Det-Bold	Details Bold Lines	Hidden 2	30	0.50
AD-Det-Fine	Details Fine Lines	Hidden 2	15	0.15
AD-Det-Med	Details Medium Lines	Hidden 2	20	0.25
AD-Det-Txt	Detail text	Cont.	31	0.25
AD-Det-XBld	Details Extra Bold Lines	Hidden 2	3	0.70
AD-Det-XFin	Details Extra Fine Lines	Hidden 2	8	0.09
AD-Det-XMed	Details Extra Medium Lines	Hidden 2	32	0.35
AD-Dim	Dimensions	Cont.	33	0.25
AD-Doors	Doors	Hidden	32	0.35



00 20 10

McGill CAD Protocol (Refer to Section 00 20 00, article 1.9)

AD-Floor	Flooring (tiles, raised floor, etc.)	Hidden	37	0.35
AD-Furn	Furniture	Hidden	35	0.35
AD-Furn-Dim	Furniture Dimensions	Cont.	31	0.25
AD-Furn-Mob	Mobile Furniture (Chairs Desks etc...)	Hidden	33	0.25
AD-Furn-Txt	Furniture Text	Hidden	31	0.25
AD-Hatch	Hatching	Hidden	8	0.09
AD-Lab	Laboratory furniture and equipment	Hidden	35	0.25
AD-Rev	Revision triangles	Cont.	31	0.25
AD-Rev-Cloud	Revision clouds	Cont.	31	0.25
AD-Room	Removed Room number	Cont.	31	0.25
AD-Part	Partitions	Hidden	30	0.50
AD-Shelves	Shelves	Hidden	32	0.25
AD-Site	Exterior landscaping	Hidden	35	0.35
AD-Stairs	Stairs	Hidden	35	0.35
AD-Txt	Demolition text	Cont.	31	0.25
AD-Windows	Windows	Hidden	32	0.35

Architectural (new construction)

AC-Axis	Axis Lines	Cont.	2	0.50
AC-Ceil	Reflected ceiling grid	Cont.	37	0.35
AC-Ceil-Txt	Reflected ceiling text	Cont.	21	0.25
AC-Ceil-Dim	Reflected ceiling Dimensions	Cont.	21	0.25
AC-Det-Bold	Details Bold Lines	Cont.	2	0.50
AC-Det-Fine	Details Fine Lines	Cont.	15	0.15
AC-Det-Med	Details Medium Lines	Cont.	20	0.25
AC-Det-Htch	Details Hatches	Cont.	9	0.09
AC-Det-Txt	Detail text	Cont.	21	0.25
AC-Det-XBld	Details Extra Bold Lines	Cont.	3	0.70
AC-Det-XFin	Details Extra Fine Lines	Cont.	9	0.09
AC-Det-XMed	Details Extra Medium Lines	Cont.	32	0.35
AC-Dim	Dimension lines	Cont.	23	0.25
AC-Doors	Doors	Cont.	22	0.35
AC-Floor	New flooring (tiles, raised floor, etc.)	Cont.	27	0.35
AC-Floor-Txt	Flooring text	Cont.	21	0.25
AC-Furn	Furniture	Cont.	25	0.35
AC-Furn-Dim	Furniture Dimensions	Cont.	21	0.25
AC-Furn-Mob	Mobile Furniture (Chairs Desks etc...)	Cont.	24	0.25
AC-Furn-Txt	Furniture text	Cont.	21	0.25
AC-Hatch	Hatching	Cont.	8	0.35
AC-Lab	Laboratory furniture and equipment	Cont.	25	0.35
AC-Lab-Txt	Associated text	Cont.	21	0.25
AC-Part	New partitions	Cont.	2	0.50
AC-Rev	Revision Triangles	Cont.	21	0.25
AC-Rev-Cloud	Revision Clouds	Cont.	21	0.25
AC-Room	New Room number	Cont.	21	0.25



00 20 10

McGill CAD Protocol (Refer to Section 00 20 00, article 1.9)

AC-Shelves	Wall-mounted shelving	Hidden	14	0.25
AC-Shade		Cont.	253	
AC-Site	Exterior landscaping	Cont.	25	0.35
AC-Site-Txt	Exterior landscaping	Cont.	21	0.25
AC-Stairs	Stairs	Cont.	25	0.35
AC-Struc	New structural walls & columns	Cont.	2	0.50
AC-Txt	General construction text	Cont.	21	0.25
AC-Windows	New windows (interior and exterior)	Cont.	22	0.35
Electrical (Existing)				
EE-Det	Electrical Details	Cont.	42	0.15
EE-Dist	Distribution schematics	Cont.	42	0.15
EE-Equip	Electrical equipment	Cont.	44	0.25
EE-Hatch	Hatching	Cont.	45	0.25
EE-Lights	Light fixtures, switches and wiring	Cont.	43	0.15
EE-Lights-Txt	Associated text	Cont.	40	0.25
EE-Power	Power, telephone, wiring	Cont.	42	0.15
EE-Power-Txt	Associated text	Cont.	41	0.25
Electrical (New construction)				
EC-Det	Electrical details	Cont.	52	0.35
EC-Dist	Distribution schematics	Cont.	52	0.35
EC-Equip	Electrical equipment	Cont.	54	0.25
EC-Hatch	Hatching	Cont.	55	0.25
EC-Lights	Light fixtures	Cont.	53	0.35
EC-Lights-Txt	Associated text	Cont.	50	0.25
EC-Power	Power, telephone, wiring, switches	Cont.	52	0.35
EC-Power-Txt	Associated text	Cont.	51	0.25
Electrical (Demolition)				
ED-Dist	Distribution schematics	Cont.	62	0.35
ED-Equip	Electrical equipment	Hidden	62	0.35
ED-Hatch	Hatching	Cont.	65	0.25
ED-Lights	Light fixtures, switches and wiring	Hidden	63	0.35
ED-Lights-Txt	Associated text	Cont.	60	0.25
ED-Power	Power, telephone and wiring	Hidden	62	0.35
ED-Power-Txt	Associated text	Cont.	61	0.25
Fire Protection				
FE-Equip	Existing Fire protection Equipment	Cont.	15	0.15
FD-Equip	Fire protection Equipment to remove	Hidden	30	0.50
FC-Equip	New Fire protection Equipment	Cont.	30	0.50

Mechanical (existing)

**00 20 10****McGill CAD Protocol** (Refer to Section 00 20 00, article 1.9)

ME-Det	Details, control diagrams, schematics,	Cont.	143	0.09
ME-Equip	Mechanical equipment	Cont.	145	0.09
ME-Fixt	Plumbing fixtures	Cont.	144	0.09
ME-Piping	Piping, and controls	Varies	140	0.09
ME-Piping-Txt	Associated text	Cont.	141	0.15
ME-Shaft	Mechanical Shaft	Cont.	144	0.09
ME-Vent	Ductwork, grilles, diffusers, controls	Cont.	142	0.09
ME-Vent-Txt	Associated text	Cont.	141	0.15

Mechanical (new construction)

MC-Det	Details, control diagrams, schematics,	Cont.	133	0.25
MC-Equip	Mechanical equipment	Cont.	135	0.25
MC-Fixt	Plumbing fixtures	Cont.	134	0.35
MC-Piping	Piping, and controls	Varies	130	0.35
MC-Piping-Txt	Associated text	Cont.	131	0.25
MC-Shaft	Mechanical Shaft	Cont.	135	0.25
MC-Vent	Ductwork, grilles, diffusers, controls	Cont.	132	0.35
MC-Vent-Txt	Associated text	Cont.	131	0.25

Mechanical (demolition)

MD-Det	Details, control diagrams, schematics,.	Cont.	153	0.25
MD-Equip	Mechanical equipment	Hidden	155	0.25
MD-Fixt	Plumbing fixtures	Hidden.	154	0.35
MD-Piping	Piping, and controls	Hidden	150	0.35
MD-Piping-Txt	Associated text	Cont.	151	0.25
MD-Shaft	Mechanical Shaft	Hidden	155	0.25
MD-Vent	Ductwork, grilles, diffusers, controls	Hidden	152	0.35
MD-Vent-Txt	Associated text	Cont.	151	0.25

Planning and Institutional Analysis Use Only

PR-Rooms	Upo-rm-num SILU Room Numbers	Cont.	21	0.25
PR-Dept	Upo-adm-unit SILU Unit Name	Cont.	7	0.15
PR-Use	Upo-rm-use SILU Room Use	Cont.	7	0.15
PR-Nsf	Upo-rm-area Room area boundaries	Dashed	70	0.09
PR-Gsf	Upo-rm-area Floor gross area boundaries	Dashed	120	0.09
PR-Bound	Upo-rm-bdry Boundary Limits of interior room without walls	Cont.	6	0.09
Pr-Furn	Upo-rm-furn Furniture	Dashed	1	0.09

Telecommunications & Computer (construction)

TC	Telecommunications & computer details	Cont.	132	0.25
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00 20 10

McGill CAD Protocol (Refer to Section 00 20 00, article 1.9)

TC-Txt	Associated test	Cont	135	0.25
Telecommunications & Computer (demolition)				
TD	Telecom & computer demolition	Hidden	112	0.25
TD-Txt	Associated text	Cont.	115	0.25
Telecommunications & Computer (existing)				
TE	Telecom & Computer existing	Cont.	122	0.09
TE-Txt	Associated text	Cont.	125	0.09
Miscellaneous				
TB-Tblock	Title block	Cont.	2	0.25
TB-Txt	Title block text and plan titles	Cont.	7	0.15
Vports	Paper space viewports	Cont.	251	Not to be plotted
Vports2	Visible paper space viewports	Cont.	21	0.25

Text Standards

Following the table shown below shall result in plotted text height of 2mm for all general drawing text, view titles, column letters are to be drawn at twice the size.

- Style name is always **RS2002**

- Dimension styles to be format, ie., **2002DIMXX**, where XX = scale of the drawing (use the ones already in the template, don't create any new dimension styles.)

Scale of the Drawing	Corresponding model space text height
1 : 1	2mm
1 : 10	20mm
1 : 20	40mm
1 : 25	50mm
1 : 50	100mm
1 : 75	150mm
1 : 100	200mm
1 : 250	500mm
1 : 500	1000mm

All drawing text to be roman simplex, width factor 0.85. All text shall exist in model space, with the exception of title block, legends, notes and related text. Specifications are not to be created in paper space.



00 20 10

McGill CAD Protocol (Refer to Section 00 20 00, article 1.9)

General

All McGill University construction drawings are to be drawn in model space with final plot representations drawn in paper space (Tilemode = 0) and scaled 1 to 1. (ie, title blocks should measure full scale and viewports to be scaled accordingly with the Scale window or Zoom XP command).

FIN DU DOCUMENT 00 20 10



DIVISION 00- INSTRUCTIONS

00 20 11 McGill Drawings Numbering Protocol (Refer to section 00 20 00, article 1.9)

Number	Title of plan	Scale	Comments
Cover page			
A-000	Cover page and List of drawings	s/o	
A-001	General notes		
A-002	Specific notes		
Implantation & Landscaping			
A-100	Site plan and details	1 :200	1 :10 are 1 :20 for details
Floor and ceiling plans			
A-200	Level XX – Demolition plan, notes and legends	1 :100	1:50 if preferable
A-201	Level XX – Demolition plan, notes and legends	1 :100	1:50 if preferable
A-202	Level XX – Construction plan, notes and legends	1 :100	1:50 if preferable
A-203	Level XX – Construction plan, notes and legends	1 :100	1:50 if preferable
A-204	Level XX – Ceiling plan, notes and legends	1 :100	1:50 if preferable
A-205	Level XX – Ceiling plan, notes and legends	1 :100	1:50 if preferable
A-206	Roof plan and details	1 :100	1 :10 for details
Elevations and Building Sections			
A-300	North and South Elevations	1 :100	
A-301	East and West Elevations	1 :100	
A-302	Elevations and sections, exterior stairs	1 :50	1 :10 for details
Walls sections and details			
A-400	Wall sections	1 :10	<i>(exterior walls)</i>
A-401	Plan Details, level XX	1 :10	
Interior details			
A-500	Interior sections, elevations	1 :50	
A-501	Interior elevations – Room XX	1 :50	
A-503	Ceiling details	1 :10	
A-504	Interior details	variable	From 1 :5 to 1 :25
A-505	Washrooms	1 :50	
A-506	Walls types	1 :10	<i>(interior partitions)</i>
A-507	Doors and frames	1 :50	
Furniture			
A-600	Plan, room XX	1 :50	
A-601	Elevations & Details	1 :20	
Vertical systems			
A-700	Stairs, plans, sections and details	1 :50	From 1 :2 to 1 :20 for details



DIVISION 00- INSTRUCTIONS

00 20 11

McGill Drawings Numbering Protocol (Refer to section 00 20 00, article 1.9)

Specifications

A-800	Specifications summary (1)	s/o
A-801	Specifications summary (2)	s/o
A-802	Specifications summary (3)	s/o

END OF SECTION 00 20 11

00 30 00

Other McGill Standards

Part 1

General

1.1

Some McGill standards listed below have to be considered together with the present document, when applicable.

1.2

Other McGill Standards

- .1 McGill Standards for Barrier-Free Campus and Universal Design (June 2004): issued by the Office for Students with Disabilities and distributed by Facilities Management/Development.
- .2 Telecommunications Infrastructure Standards for McGill University (Feb. 22, 2005): issued by McGill Network and Communications Services (NCS).
- .3 McGill University Interior Signage Standards (Jan 2009): issued by Facilities Management and Development
- .4 McGill Exterior Signage Policy and Guidelines (May 30, 2001) Issued by the University Secretariat
- .5 Classroom Design Standards (Draft May 2005) *in revision*
- .6 Facilities Management Safety Manual:
<http://www.mcgill.ca/ehs/plant/facilities/>
- .7 Laboratory design Standards
<http://www.mcgill.ca/ehs/laboratory/design/>
- .8 McGill Laboratory Safety Manual:
<http://www.mcgill.ca/ehs/laboratory/labsafety/>
- .9 McGill Radiation Safety Policy Manual, Edition 5.1:
<http://www.mcgill.ca/ehs/radiation/manual/>
- .10 McGill Biosafety Manual:
<http://www.mcgill.ca/ehs/biosafety/manual/>



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DIVISION 00- INSTRUCTIONS

00 30 00 Other McGill Standards

1.3 Design requirements

- .1 It may become apparent that there are contradictions with respect to the requirements of the McGill Building Standards and these other McGill references.
- .2 Such contradictory or conflicting requirements should be reported to the Executive Director, Facilities Development, University Services for resolution.

END OF SECTION 00 30 00



DIVISION 01- GENERAL REQUIREMENTS

01 02 01 Design Requirements for Special Building Areas

Part 1

General

1.1 Generalities

- .1 Space planning requirements for new buildings shall conform to the standards of the Ministry of Education of Quebec and to the requirements of the McGill University Planning Office.

1.2 Animal Facilities

- .1 For all "Animal Facilities" designs, refer to the "Guidelines on laboratory animal facilities-characteristics, design and development" issued by the Canadian Council on Animal Care, last version.

1.3 Classrooms

- .1 For all classroom designs, refer to the "Classroom Design Guidelines" (Rev. 1, May 2005), as supplied by Facilities Development and Management. (*In Revision*)
- .2 Partitions around classroom designs shall extend to the underside of slab and be insulated for sound (min. STC 52).

1.4 Custodial areas

- .1 Janitor's closets:
 - .1 Provide a minimum of one closet for every 1400 m² (15,000 square feet) of floor.
 - .2 Provide standard janitors closet minimum 1500 mm by 1800 mm (5'0" x 6'0"). Closet shall be large enough to store mechanical cleaning equipment.
 - .3 Provide door with minimum width of 915 mm (36 inches).
 - .4 Provide ceramic tile flooring with cove base. Walls shall be painted.
 - .5 Provide each closet with shelving on one wall.
 - .6 Provide one floor mounted slop sink with hot and cold water faucets at standard height, with a stainless steel backsplash at 915 mm height (36 inches)
 - .7 Specify a floor drain with basket.
 - .8 Specify fluorescent lights, electrical duplex receptacles (GFCI protected within 6' of sink), and proper receptacle for the power of floor polisher.
 - .9 Specify a closet organiser/tool holder for each closet.
 - .2 Garbage Rooms
 - .1 Garbage rooms in buildings shall be large enough to store both standard waste containers and recycling containers.
-



DIVISION 01- GENERAL REQUIREMENTS

01 02 01 Design Requirements for Special Building Areas

- .2 Standard waste containers are 45 gallons, 2.5 feet (750 mm) in diameter.
 - .3 Standard recycling containers are 45 gallons, 2.0 feet x 2.5 feet (600 mm x 750 mm).
 - .4 Consult McGill building services for quantities required.
 - .5 Garbage rooms shall be equipped with a floor mounted slop sink, floor drain, water source and ventilated air change.
 - .6 Shall have a 1 hour fire resistance rating and shall be protected with sprinklers
 - .7 Garbage rooms that end with garbage chute shall have a 2 hour fire resistance rating. The chute shall be protected with sprinklers as specified by NFPC.
- .3 Building Services Equipments Rooms
- .1 When the janitor's closet cannot welcome the cleaning equipment, provide a space to store the equipment. Consult McGill Building Services for dimensions.
- .4 Building Services Storage Rooms
- .1 Provide space in the Building for the storage of a one-month supply of custodial supplies.
- .5 Staff lunch Rooms
- .1 Provide a lunchroom separate from the supplies storage for staff according to the "Règlement pur la Santé et Sécurité au Travail".

1.5 Entrance Vestibules

- .1 Main entrance vestibules shall have a minimum of 2135 mm (7'0") between doors.
- .2 Each vestibule shall have a stainless steel foot grille and pan 1800 mm (6'0") min. wide by preferably the full length of the vestibule. (See Section 12 48 20)
- .3 Flooring shall be selected for its durability (ex.: vinyl sheet, terrazzo, quarry tiles, etc.) All sheet flooring shall be homogeneous.

1.6 Hazardous Waste Storage Areas

- .1 The Manager of the Hazardous Waste Program should review design specifications for any holding areas for hazardous waste products.

1.7 Loading Docks

- .1 Provide space for refuse containers and utility carts. The specific refuse containers shall be reviewed with the McGill Building Services early in a design process.
- .2 Provide access for the large 34 cubic yard trucks to service the container.



DIVISION 01- GENERAL REQUIREMENTS

01 02 01 Design Requirements for Special Building Areas

- .3 Provide dock levellers and truck restraints where required.

1.8 Offices

- .1 All **new** offices shall have natural light when possible, a triple coat hook behind door, shelving, telephone and network connections and a minimum of three electrical outlets.
- .2 Office sizes should conform to the following space norms:
 - Executive offices: 18.6 m² (200 ft²)
 - Academic, professional, and research staff offices: 12.5 m² (135 ft²)
 - Technical and auxiliary research staff offices: 9.3m² (100 ft²)
 - Clerical staff offices: 11.1 m² (120 ft²)
- .3 Doors to offices shall be located **150 mm (6")** from the nearest wall to the door frame. This is to allow space for coat hooks behind the door.
- .4 Partitions around Executive offices shall extend to the underside of slab and be insulated for sound (min. STC 47).
- .5 Partitions around other offices shall extend to the underside of suspended coating.

1.9 Operations Storage Rooms

- .1 For every new building, a room of 11.1 m² (120 ft²) is required for storage.

1.10 Room Numbering

- .1 Refer to the "Room Numbering Guidelines" (May 1, 2006) issued by Planning & Institutional Analysis, (<http://www.mcgill.ca/pia/plans/autocadstandardsandguidelines/>)

1.11 Stairs & Ramps

- .1 All stair treads and landings must have slip resistant surfaces with all nosings a different colour from the remainder of the tread.
- .2 For all new exterior stairs and/or ramps install tactile and/or visual aides:
 - .1 Yellow strips at top and bottom of stairs or ramp, use epoxy adhesives by "K-Grip", or Chemorset 100 as manufactured by "Chemor", or approved equivalent.
 - .2 Use tactile dots inserted into stone or concrete.



DIVISION 01- GENERAL REQUIREMENTS

01 02 01 Design Requirements for Special Building Areas

1.12 Suspension of Materials above Ceilings

- .1 The Architect/Engineer (A/E) shall design the means of suspending systems from the slab above, and allow space for the hangers. Piping, ductwork, and equipment shall have independent support systems (i.e. piping shall not be supported from ductwork supports, etc.) Do not suspend anything (including electrical conduit) from ductwork. Show trapeze hangers on the drawings, and provide additional details as necessary to convey the A/E's intent to the Contractor. Verify that sufficient space exists above existing suspended ceilings for the design.

In existing buildings new piping, ductwork and equipment shall not be supported from existing hangers and/or existing supplementary steel without A/E verification of existing component conditions and loading capacities.

1.13 Telecommunication / Data Rooms

- .1 For buildings over 800 m² (8,000 ft²) the following shall apply:
 - .1 For every 1,000 m² (10,000 ft²) of floor there shall be one telephone closet with a minimum of one telephone closet per floor.
 - .2 Closet spaces shall be as follows:
 - .1 1,000 m² (10,000 ft²) of serving area, closet size shall be 3 m x 3.4 m (10' x 11').
 - .2 800 m² (8,000 ft²) of serving area, closet size shall be 3 m x 2.8 m (10' x 9')
 - .3 500 m² (5,000 ft²) of serving area, closet size shall be 3 m x 2.2 m (10' x 7')
 - .3 Each closet shall have a minimum of two walls covered with rigidly fixed 19 mm (3/4") x 2,440 mm (8'-0") high fire-rated plywood, smooth on one side and capable of supporting attached equipment.
- .2 For smaller buildings under 800 m² (8,000 ft²) the following shall apply:
 - .1 Walk-in-type closets may be used and shall be a minimum of 1.3 m deep x 1.3 m wide (4'-6" x 4'-6") to serve a floor area of up to 500 m² (5,000 ft²). To serve each additional 100 m² (1,000 ft²) add 1 m² (10 ft²) to the closet floor area, up to a maximum of 800 m² (8,000 ft²).
 - .2 Shallow-type closets may also be used and shall be a minimum of 0.45 m deep x 2.6 m wide (1'-6" x 8'-6") to serve a floor area of up to 500 m² (5,000 ft²). To serve each additional 100 m² (1,000 ft²), add 1 m² (10 ft²) to the closet floor area, up to a maximum of 800 m² (8,000 ft²). Shallow closets must have a minimum 1,800 mm (6'-0") wide double door.
 - .3 Each closet type shall have the rear wall covered with rigidly fixed 19 mm (3/4") plywood smooth on one side and capable of supporting attached equipment.



DIVISION 01- GENERAL REQUIREMENTS

01 02 01 Design Requirements for Special Building Areas

1.14 Washrooms

- .1 Refer to each section for the special Requirements for washrooms.

1.15 Mechanical Rooms

- .1 All mechanical room floors and curbs which are not slabs on grade shall be waterproofed to prevent leakage into occupied space below.

END OF SECTION 01 02 01



01 02 02 Roofing Materials Cutting & Patching

Part 1 General

1.1 General

- .1 In general, follow the standards below when specifying cutting and patching of roofing. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgement.

1.2 Warranty Requirements

- .1 Important considerations to remember when specifying roofing cutting and patching are:
 - .1 Warranty patching work must be performed in a manner which will not void the manufacturer's warranty. Installers shall provide a proof of membership in the "Association des Maîtres Couveurs du Québec" (AMCQ).

1.3 Submittal Requirements

- .1 Require the following submittals in the cutting and patching specification:
 - .1 Qualification data for firm engaged to perform cutting and patching of roofing system.

1.4 Quality Assurance Requirements

- .1 Include the following Standards in the Quality Assurance article in cutting and patching specification:
 - .1 Perform cutting and patching work in compliance with the AMCQ Manual.
- .2 Include the following requirements in the Quality Assurance article of the cutting and patching specification:
 - .1 Installer Qualification:
Arrange for cutting and patching of roofing systems by firm experienced in similar work, and licensed by manufacturer of roofing system to perform required repair work.

1.5 Other Provisions

- .1 In the "Part 2 – Products" portion of cutting and patching specification, include your standard language conveying the following ideas:
 - .1 Use materials for patching identical to existing materials. Use materials for patching that result in equal-or-better performance characteristics.



DIVISION 01- GENERAL REQUIREMENTS

01 02 02 Roofing Materials Cutting & Patching

- .2 In the “Part 3 – Execution” portion of cutting and patching specification, include the following requirement:
 - .1 Before cutting and patching roofing materials, obtain the McGill Project Manager’s approval to proceed.

END OF SECTION 01 02 02

DIVISION 01- GENERAL REQUIREMENTS

01 56 00 Temporary Barriers and Enclosures

Part 1 General**1.1 Summary**

- .1 In general, follow the standards below when specifying temporary enclosures on McGill University. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 Specify isolated enclosures for separating spaces in which dust-generating activities are executed, in order to protect workers, the public, in addition to those areas or surfaces where work has been completed.
- .2 Coordinated with the Project Manager the location of the temporary enclosures.
- .3 Specify to the General Contractor all areas where protections are normally required for a dust barrier, and when required, barrier for water, humidity, sound, fire, and smoke, etc.
- .4 Containment: For all work adjacent to laboratory or other clean spaces, ensure that the site will be isolated with a containment barrier during demolition and construction work.

Part 2 Product**2.1 Partitions**

- .1 Specify temporary enclosures, slab to slab, perimeter and junctions sealed in order to obtain a partition perfectly dust proof:
 - .1 Metal studs 92mm at 600mm c/c
 - .2 Gypsum boards 16mm, sealed joints
 - .3 8 mils polyethylene sheet overlapped and sealed
 - .4 Mineral wool 38mm
 - .5 Gypsum boards 16mm, sealed joints

2.2 Containment barrier (to be used when 2.1 is not done)

- .1 Shall consist of a plastic curtain seamlessly fixed to the ceiling and floor. Using a shop vac and/or filter and/or water mist while cutting gypsum, sanding, etc must restrict the amount of dust and particles generated in the site and infiltration to the laboratory or clean room. A filter shall be supplied and ran on site for the duration of the work.



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DIVISION 01- GENERAL REQUIREMENTS

01 56 00 Temporary Barriers and Enclosures

END OF SECTION 01 56 00



DIVISION 01- GENERAL REQUIREMENTS

01 74 21

Construction/Demolition Waste Management and Disposal

Part 1

General

1.1

Summary

- .1 In general, follow the 3R principles (reduce, reuse and recycle). The objective is to divert a minimum of 75% (in weight or volume) of waste from going into landfills.
- .2 Existing items in good conditions are to be reused. Consultants must identify these items at the design phase. In decreasing order of preference, specify:
 - .1 Reuse in the new project, if suitable.
 - .2 Reuse in other McGill projects if there is an opportunity, to be coordinated by Project Manager.
 - .3 Send to a recuperation center. The Contractor shall submit proof to this effect.
- .3 Triage of waste must be done on site:
 - .1 The use of many small containers on the job is appropriate. The use of many small street containers is possible or a single standard container with inner separations. Although, the use of a company working with trucks (including labour, hauling and disposal fees) is preferable for small projects (ex.: 1-800-got-junk or approved equivalent).
 - .2 Container locations, sizes and organisation, along with the security issues have to be planned ahead with the Project manager.
 - .3 Hazardous waste are to be dealt with separately following Quebec regulations. They are not to be included in calculations of diversion of landfill.
 - .4 Main items to be segregated on site and some specific procedures:
 - .1 Metal;
 - .2 Bricks;
 - .3 Asphaltic items (membranes, shingles, etc);
 - .4 Paper and cardboard;
 - .5 Wood class 1: not painted, treated or stained. This wood is in its natural state.
 - .6 Wood class 2: all other type;
 - .7 Gypsum and plaster (if containing asbestos, to be dealt with separately under asbestos conditions regulations);
 - .1 Gypsum shall be removed in large pieces and be segregated on site. The gypsum container may also contain metal (studs and screws) if the recycling facility allows.
 - .2 The Contractor shall ensure gypsum protection (i.e.: from rain, etc.) for recycling purposes.



DIVISION 01- GENERAL REQUIREMENTS

01 74 21 Construction/Demolition Waste Management and Disposal

- .8 Ceiling tiles (if containing asbestos, to be dealt with separately under asbestos conditions regulations):
 - .1 Non Damaged ceiling tiles shall be sent to be reused and damaged tiles shall be sent to a recycling facilities. The Contractor shall submit proof to this effect.
- .9 Floor tiles (if containing asbestos, to be dealt with separately under asbestos conditions regulations):
- .10 Concrete and aggregate:
 - .1 No aggregate material shall be broken, shattered or crushed outside unless specific interventions are required to prevent dust formation and noise.
- .11 Glazing:
 - .1 Glazing shall be set aside from other wastes to be recycled. It shall be put in a separate container.
 - .2 Glass plates shall be removed intact..
 - .3 If glazing must be reduced length wise to fit inside the container, it shall be done on site with a glass cutter, to eliminate waste.
- .12 Wiring:
 - .1 Wiring shall be separated from other metallic waste.
 - .2 Electrical wiring shall be put aside, free of capacitors and sockets, for recycling purposes at an approved site for such type of products. The Contractor shall submit proof to this effect.
- .13 Doors, frames, hardware and windows
 - .1 Doors, door frames, hardware and windows reuse (of the whole or a part) in good shape shall be reused (see article 1.1.2). Damaged units shall be sent to a recycling facilities according to their material composition. The Contractor shall submit proof to this effect.
- .14 Light fixtures
 - .1 Existing fluorescent tubes and light bulbs shall be set aside for recycling purposes and directed to an approved site for such type of products. The Contractor shall submit proof to this effect. Acceptable recycling site: Chemtech Construction
 - .2 Ballasts and capacitors marked as “non-PCB” on unit must be placed in a plastic bucket labelled “non-PCB electrical equipment”, for recycling purposes at an approved site for such type of products. The Contractor shall submit proof to this effect.
 - .3 Other ballasts and capacitors shall be placed in a plastic bucket labelled “PCB electrical equipment”, for recycling purposes at an approved site for such type of products. The Contractor shall submit proof to this effect.
- .15 Carpets



DIVISION 01- GENERAL REQUIREMENTS

01 74 21 Construction/Demolition Waste Management and Disposal

- .1 All carpets shall be sent to an approved recycling site for such type of products (see section 09 68 00 - Carpeting). The Contractor shall submit proof to this effect.
- .16 All separable objects: movable furniture or built-in, plumbing equipment, etc.;
- .4 “Receipt certification” (or “Feuille de route”) have to be used and all originals shall be submitted to McGill as a proof that the materials were sent to the right receiver. These forms shall mention the material and quantity of the truck or container leaving the site, the date and time, and be signed by the trucker and the reception company.
- .5 A detail report containing the following information has to be given to the Project manager on a monthly basis (or at the end of the project for small projects):
 - .1 Materials descriptions;
 - .2 Volume or weight;
 - .3 Name and address of recycling company;
 - .4 Name and address of charitable organisation;
 - .5 Weight tickets;
 - .6 Photos of each loaded truck or container leaving the site
- .6 Hazardous waste
 - .1 Asbestos, see section 02 82 10 – Asbestos abatement.
 - .2 Mould, see section 02 85 00-- Mould remediation (*section to come*)
 - .3 PCB containing materials:
 - .1 Contractor needs to go to McGill Waste Management to get two (2) drums for PCB and Non-PCB content. These materials are to be placed inside these drums to be sent back to McGill Waste Management Program who would dispose of their content.
 - .4 Mercury
 - .1 Liquid mercury containing materials or items are to be placed inside plastic pail labelled “mercury waste”.
 - .2 Mercury containing switches, thermostats, HVAC controls or other assemblies of that nature are not to be disassembled but to be placed into a plastic pail (4L or 20L) labelled “mercury waste”.
 - .3 Traps under all fume hood sink shall be carefully emptied from their deposits into a plastic bag.
 - .4 The contractor needs to bring the pails to McGill Waste Management Program who will dispose of their content.



DIVISION 01- GENERAL REQUIREMENTS

01 74 21 Construction/Demolition Waste Management and Disposal

- .5 If mercury containing equipment are broken causing the release of mercury it has to be immediately cleaned up in accordance with the Contractors written Health and Safety plan.
- .6 In the event of a release of mercury, the Project manager and McGill Environmental Health and Safety Office must be notified immediately.
- .5 Halocarbon refrigerant recovery
 - .1 Equipment containing halocarbon refrigerants may include air conditioners, dehumidifiers, commercial building cooling systems (chillers and roof-top units), refrigerators and freezers, heat pumps and air conditioning systems. Only qualified personnel under Regulation Respecting Halocarbons sections 44 or 45 may dismantle a refrigeration unit, an air conditioning unit or fire extinguishing equipment designed or converted to operate with a halocarbon. Contractor must provide proof of qualification in the bid document.
 - .2 The contractor must provide a proof of proper disposal, storage or reuse.
- .6 Lead
 - .1 Tests have to be conducted to identify lead contamination in painting. If materials are contaminated with lead, they have to be dealt with separately following Quebec regulations. They are not to be included in calculations of diversion of landfill.
- .7 All oil tanks, furnaces and equipment of this type to be removed by McGill Waste Management Program before project starts.

END OF SECTION 01 74 21



02 01 01 Tree Preservation

Part 1 General

1.1 Summary

- .1 In general, follow the standards below for the tree preservation on McGill University. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.
- .2 Refer to Division 32 - Exterior Improvements for addition landscaping requirement and information.

1.2 Design Requirements

- .1 A tree survey will be done as part of the pre-design work for the campus development projects. The survey will show the location of the existing tree on Campus. A tree arboriculture consultant will be hired to prepare a document. In this document the consultant will categorize the trees:
 - .1 All Memorial trees and their associated documentation;
 - .2 Trees of important ornamental value that should be maintained and cared for;
 - .3 Trees that can be relocated (transplanted for the needs of a new project);
 - .4 Dying or diseased trees to be removed for safety issues;
 - .5 The removal of aggressive weed trees (Manitoba Maple, Acer Negundo) and replaced with a recommended species.
- .2 All new projects involving the removal of a tree must be accompanied with a permit from the City of Montreal which may also require the approval of the Ministry of Culture of Quebec. McGill Campus is almost entirely within the limits of the 'Arondissement historique et naturel de Mont Royal', a protected area under the jurisdictional authority of the Ministry of Culture of Quebec, and we must inform the Gardens and Grounds Committee and McGill's horticulturist (as specified in Item 1.4) prior to taking any action involving a tree.
- .3 All projects involving pruning, cutting, removal, etc. of trees should involve the campus horticulturist, McGill's Gardens and Grounds Committee and if needed, a tree consultant.
- .4 Standards to conform:
 - .1 NQ 0605-100/2001 "Aménagement paysager à l'aide de végétaux"
 - .2 NQ 0605-200/2001 "Entretien arboricole et horticole"
 - .3 NQ 0605-300/2001 "Produits de pépinières et de gazon"
 - .4 NQ 0605-400/2001 "Produits de serres"



02 01 01 Tree Preservation

- .5 Drawing specifications should call for proper protection of existing trees when contained within or adjacent to a construction site.

1.3 Specific Procedure for removal and relocation

- .1 The area for the re-location of the tree(s) will be decided in house. The Garden and Grounds Committee and McGill's horticulturist will provide a new site, all in regards to the University's Master Plan.
- .2 The projects responsible for removing the tree will fund the transplantation and tree arboriculture consultant fees and/or the tree replacement.
- .3 A Tree arboriculture contractor with certification will be hired for the removal of the tree. McGill safety recommendations must be followed at all times.
- .4 For any tree above a calliper of 150mm the expertise of a tree arboriculture consultant is required to evaluate the feasibility and chances of success and to provide a document for the project manager with his recommendations.
- .5 Relocation and transplantation of a tree on site must be accomplished by either a tree spade or by the balled and burlap method.
- .6 Replacement trees should be the same size if possible, if this is not practical, for any cut tree bigger than 200mm, the largest of the tree of the same species available in a nursery specialized in big calliper tree, should be purchased.
- .7 If this is again not possible, several trees of smaller calliper should replace a bigger one.
- .8 The replacement tree location will either be on the project site or on any given campus location previously determined by the Gardens and Grounds Committee and the horticulturist.
- .9 All debris shall be removed from the project site on the same day.

END OF SECTION 02 01 01



02 41 16 **Selective Site Demolition**

Partie 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying demolition work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirement

- .1 Clearly indicate items or equipments to be relocated. Indicate their actual and future location.
- .2 Indicate to protect existing items designated to remain and items designates for salvage
- .3 Indicate on plans the location of all temporary partitions requested for dust control.
- .4 In the event that existing components contain asbestos, consult the University Project Manager.

1.3 Restriction

- .1 Crane cannot operate on McGill Campus during the day between 8:00 am and 17:00 pm, without special approval by the Project Manager.
- .2 Location of crane must be approved by the Project Manager.
- .3 Specify the period of the day to avoid noise in the building.
- .4 In coordination with the Project Manager, specify the path to evacuate garbage.

Partie 2 Products

2.1 Existing Conditions

- .1 Specify to remove, protect, store items to be relocated. Clearly identify items.



DIVISION 02- EXISTING CONDITIONS

02 41 16 **Selective Site Demolition**

2.2 Temporary protection

- .1 Specify temporary enclosures, slab to slab, perimeter and junctions sealed in order to obtain a partition perfectly dust proof:
 - .1 Metal studs 92mm at 600mm c/c
 - .2 Gypsum boards 16mm, sealed joints
 - .3 8 mils polyethylene sheet overlapped and sealed
 - .4 Mineral wool 38mm
 - .5 Gypsum boards 16mm, sealed joints
- .2 Any other composition for temporary partition must be approved by the Project Manager.

Partie 3 Execution

3.1 Cleaning

- .1 Specify the frequency of cleaning and the appropriate methods.

END OF SECTION 02 41 16



DIVISION 02- EXISTING CONDITIONS

02 82 10 Asbestos Abatement

Part 1 General

1.1 Summary

- .1 More than 50% of McGill University's buildings contain asbestos products; consequently many renovation projects will encounter asbestos containing materials. To be certain that the health of the University Community is not impaired, asbestos must be considered in the project design. The consultants must advise immediately the Project Manager if they suspect asbestos is present inside or adjacent to areas of the renovation project and conduct their work accordingly.

1.2 Design Requirements:

- .1 All projects in areas where asbestos is present must have general asbestos removal or containment notes informing the contractor of his obligations. This note shall specify the type of asbestos, the location and the level of risk.

END OF SECTION 02 82 10



03 05 10

Concrete

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying concrete work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 Supported slabs:
 - .1 Design slabs at least 5 ½ inches thick, unless otherwise required by code or expected live loads. Do not use thinner slabs even if structurally feasible, without the approval of the Project Manager.
- .2 Flat Slabs on Grade:
 - .1 The vapour barrier is usually required. The practice of perforating vapour barriers to avoid the phenomenon of “slab curling” is not acceptable
 - .2 Design the slabs on grade with the following thickness:
 - .1 General: 4 inches, or greater if required by expected live load.
 - .2 Mechanical rooms: 5 inches, or greater if required by expected live load.
 - .3 Strength: As required, but not less than 45MPa (5500psi) at 28 days.
- .3 Finishes
 - .1 Specify the finish recommended for the floor finishes
- .4 Specify that a written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.
- .5 Exterior slabs on grade and sidewalks: as required, but not less than 45Mpa (5000psi) at 28 days.
- .6 For existing concrete slabs, the maximum level difference shall be 3 mm per 1 m.
- .7 Exterior concrete steps must have a minimal slope of 0.5% towards the exterior to allow for sufficient water drainage and to prevent ice formation.
- .8 Levelling of existing slabs:
 - .1 Patching less than 2 m diameters: use “Planipatch” as manufactured by Mapei, or approved equivalent
 - .2 Surface levelling differences from 1 mm to 50 mm, use: “Duocrete” as manufactured by Duochem, or approved equivalent.



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DIVISION 03- CONCRETE

03 05 10

Concrete

END OF SECTION 03 05 10



04 05 10

Common Work for Masonry

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying masonry work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 Exterior masonry selection
 - .1 The Project Manager will coordinate brick and stone selection with the Architectural Advisory Committee. Selection prior to bidding is required. Typically the selection process is as follows:
 - .1 Early in design phase, determine if masonry selection is required. Determine criteria with the Project Manager.
 - .2 Choose sample including special shapes and prepare as presentation with drawing, pictures and sample.
 - .3 Project Manager and Architect to meet with the Architectural Advisory Committee.
 - .4 The Architect/Engineer is to modify design accordingly to the Architectural Advisory Committee's comments for bidding documents.

Part 2 Products

2.1 Concrete Unit Masonry

- .1 All blocks; except where solid block is required, shall be autoclaved, standard weight, hollow and non-load bearing. Blocks shall be complete with all special shape as required, including lintel blocks.

2.2 Mortar and Grout

- .1 Mortar ingredients shall consist of Portland cement, sand, hydrated lime, potable water, and inorganic, non-staining, non-fading pigments. The use of calcium chloride or admixtures containing calcium chloride in mortar **is not permitted**.

2.3 Accessories

- .1 All masonry accessories shall consist of galvanized steel.



04 05 10

Common Work for Masonry

Part 3

Installation

3.1

Cavities

- .1 In order to avoid mortar accumulation within the cavity, it is recommended to specify a cavity space of 38 mm.

3.2

Cleaning

- .1 Do not specify acids without prior written approval.

END OF SECTION 04 05 10



05 50 00 Metal Fabrication

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying metal fabrication work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 Fire exit stairs: Typically, fire exit stairs are considered utility spaces where safety and economy should take precedence over aesthetics. Stair designs with straight runs shall specify that metal grating is commonly used for exterior fire escapes. Treads must be metal grating.
- .2 Ornamental Stairs: More flexibility can be expected concerning stairs with major aesthetic impact. The Architectural Advisory Committee must review the design of such stairs.
- .3 Exterior metal fabrication: Specify hot-dipped galvanized steel and stainless steel type 304. Specify type 316 for all exterior locations exposed to salts. Other types of metal may be used with the approval of the Project Manager.
- .4 Guards with rail-type horizontal bars are not permitted under any circumstances.
- .5 Exterior painted guardrails shall be painted stainless steel type 304. (See Execution).
- .6 For all primers and painting of hot-galvanized structures, see section 09 91 26 – Painting.

1.3 Guarantee

- .1 All work under this section shall be guaranteed for a period of one (1) year from the date of substantial performance of the work.

Part 2 Products

- .1 Grout and anchoring cement
 - .1 Handrails in concrete paving and walks may be set in sleeves or core drilled holes. Depth of core must be not less than 4-inches deep and of a diameter not less than 1-inch wider than outside pipe diameter. Set rails in non-shrink, erosion resistant grout.
- .2 Isolation coating
 - .1 Specify to isolate aluminium from following components, by means of bituminous paint:



05 50 00 Metal Fabrication

- .1 Dissimilar metals
- .2 Concrete, mortar, and masonry
- .3 Finishes
 - .1 Specify passivated stainless steel #304 for general use.
 - .2 Specify one shop coat of primer for all metal items, with exception of galvanized, stainless steel or concrete encased items.
 - .3 Specify galvanized finish for all exterior items.
 - .4 Specify hot-dipped galvanized steel for all exterior guardrails and handrails exposed to weather. Alternatively, stainless steel, bronze, anodized aluminium may be used with the approval of the Architectural Advisory Committee.

Part 3 Execution

- .1 For painted stainless steel #304, follow these instructions:
 - .1 Once the elements are welded and ready to paint, sandblast the stainless steel elements, followings SSPC-SP6 (NACE3) standards, with maximum thickness of 2.5 mils. The sandblasting machine must only be used on aluminum or stainless steel elements, in order to avoid contamination to the elements.
 - .2 For painting method and number of coats, see section 09 91 26 - Painting.
 - .3 Provide a sample of the finish product for approval before beginning the work.

END OF SECTION 05 50 00



06 10 10 Rough Carpentry

Part 1 General

1.1 Summary

- .1 In general, follow these standards below when specifying rough carpentry work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgement.
- .2 Shall not specify any wood treated in arsenic.

1.2 Design Requirements

- .1 Wood products shall be certified by one of the following standards to ensure they are issued from sustainable forests:
 - .1 CSA (Canadian Standards Association);
 - .2 FSC (Forest Stewardship Council);
 - .3 SFI Inc. (Sustainable Forestry Initiative).
- .2 Specifications for electrical room: all plywood used as supports for electrical equipment shall be treated with fire retardant.

Part 2 Products

- .1 Fasteners/anchors: For all exterior work, fasteners shall be in galvanized steel

END OF SECTION 06 10 10



06 20 00 Architectural Woodwork

Part 1 General

1.1 Summary

- .1 In general, follow the standards when specifying architectural woodwork. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgement.

1.2 Design Requirements

- .1 Each office shall be equipped with wall mounted coat hooks.
- .2 Each coat closet shall have a hat shelf and an adjustable chrome hanging rod.
- .3 For large quantities of cabinetry work, a 2'-0" wide mock-up of the cabinetry is required prior to execution.
- .4 Wood products shall be certified by one of the following standards to ensure they are issued from sustainable forests:
 - .1 CSA (Canadian Standards Association);
 - .2 FSC (Forest Stewardship Council);
 - .3 SFI Inc. (Sustainable Forestry Initiative).

Part 2 Products

2.1 Materials

- .1 Framing lumber: Shall be softwood
- .2 MDF panels shall be made with 100% recycled wood fiber and contain no added formaldehyde.
- .3 Particle boards shall be made with 100% recycled and/or recovered wood fiber, containing no added formaldehyde.

2.2 Work Counters

- .1 Counter tops shall be made of laminated 19mm and 13mm plywood, with a humidity level not more than 8%, covered with plastic Laminate 1.5mm thick.
- .2 Cable entries (grommets) where necessary.



06 20 00 Architectural Woodwork

2.3 Washroom Vanities

- .1 Counter tops shall be made of 19mm plywood with a humidity level not more than 8%.

2.4 Shelving

- .1 Shelf: shall be 19 mm plywood, 305 mm wide by length as shown on the drawings. Shelves shall be spaced horizontally at 405 mm c/c with the bottom shelf at 405 mm from the floor, unless noted otherwise. All exposed edges of the shelves shall be capped with 6 mm x 19 mm wood moldings. All shelves shall be painted as per the walls.
- .2 Standards: shall be 22mm (7/8") single Heavy- Duty vertical wall Standards, chrome finished # 087XX(*length*)-143 by Richelieu or approved equivalent. All wall Standards shall be aligned with the wall studs for added strength.
- .3 Supports: shall be chrome finished #187XX(*length*)-by Richelieu or approved equivalent, spaced at 610 mm (24") c/c.

2.5 Cabinet and shelving hardware

- .1 Hinges: shall be "Euro" concealed Module 107^o type as manufactured by "Blum" with full overlay or approved equivalent.
- .2 Equivalent Flush Pulls: for sliding glass cupboard doors shall be style No. 1510 rectangular, black by "Cluthe Sales (Waterloo) Ltd." or approved equivalent.
- .3 Door Catches: shall be roller catch type 603-2G with zinc finish by "Richelieu" edition 05-2004 or approved equivalent.
- .4 Drawer Slides: Ball bearing full extension No.3832 with clear zinc finish by "Accuride"
- .5 Glass: for cupboard doors shall be 6 mm (1/4") clear tempered.
- .6 Shelf support standards:
 - .1 Metal pilasters type 2332GXX(*lenth*) by Richelieu edition 07-2003
 - .2 Supports type CP2562G by Richelieu edition 07-2003

2.6 Coat Hooks

- .1 Wall mounted coat hooks shall consist of three (3) metal hooks type-chrome heavy duty 5½" 237CV by "Richelieu", spaced evenly on a MDF panel backing mat painted 150 mm x 450 mm x 19 mm (6" x 18" x 3/4") with painting finish as per wall. Coat hooks shall be installed at 5'-6" from finished floor to bottom of backing (typical).



06 20 00 Architectural Woodwork

2.7

Closets

.1

Each closet shall have a 25 mm x 305 mm painted MDF hat shelf, unless noted otherwise, and painted as per the walls. An adjustable chrome hanging rod shall be as per Richelieu #122.208.140 and #1225-140.

END OF SECTION 06 20 00



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 52 00 Roofing

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying roofing work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Roofing systems requiring the use of open flame or torch are not permitted on wood deck roofs.
- .2 Inspection of Occupied Spaces beneath Roofs
 - .1 Before undertaking a new re-roofing project in an existing building, consultants shall inspect the occupied spaces beneath the roof and discuss the implications of the roofing work with the occupants of the building.
 - .2 It shall be obligatory to have the roofing contractor who is awarded the contract also inspect and take note of the condition of the existing occupied spaces beneath the roof upon which his contract will be performed, in order to assess and appreciate the risk that roof leaks would pose to the occupied space.
- .3 Roof Insulation Retrofit to Old Buildings
 - .1 Any contemplated installation of new insulation to retrofit old buildings envelopes must be approached with great care, especially if the building has never been insulated. In principle, nothing should be done to change the existing thermal gradient characteristics of the old roof-ceiling assembly or the pattern of air circulation or vapour migration across the roof-ceiling assembly, unless it can be demonstrated that by undertaking such changes, nothing is done that would create new problems such as new cold spots, new condensation possibilities in the roof-ceiling assembly.
- .4 Slopes to drain should be unobstructed by above-roof building elements, equipment curbs, or similar objects. Where such obstructions are unavoidable, provide cants, saddles, or other means to restore positive pitch to drain.
- .5 Minimize parapet heights and run single-ply roofing materials up and over the top of parapets (beneath coping caps) whenever possible.
- .6 Noise and Vibration – Attachment of underlayment, insulation, and other roofing materials may cause noise and vibration problems. This is especially true for applications over concrete roof structures where the structure may transmit noise throughout the building. Consult with the Project Manager to determine whether special requirements for evening or weekend work are necessary.



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 52 00 **Roofing**

.7 Dust Protection – Specify the provision of dust protection over occupant’s equipment and furnishings where appropriate. For example, specify protection for top floor areas that are occupied (not penthouses) and that do not have suspended ceilings. Where occupant’s activities may be particularly sensitive to dust, specify protection regardless of presence of suspended ceiling. Note that dust protection should be applied and removed in coordination with occupant’s operations. Consult with the Project Manager for more guidance.

.8 Snow guard – On sloped roofs, specify snow guards on all eaves. Specifications will be revised by the Architectural Advisory Committee (AAC).

1.3 **Guarantee**

.1 The minimum guarantee shall be five (5) years as supplied by the roofing contractor. The QMRA special five-year warranty shall not be required.

Part 2 **Products**

2.1 **Membrane Roofing**

.1 The preferred membrane roofing system is a two ply modified asphalt bitumen system of ELASTOPHENE 180 (SOPREMA or IKO equivalents) adhered in a BURMASTIC adhesive (TREMCO or equivalent) or other cold press modified asphalt compatible with standard modified bitumen felts.

.2 The second best choice is a five ply traditional asphalt and gravel. However, whenever geometries allow, the two ply modified bitumen should be installed in preference to five ply asphalt and gravel.

.3 Single ply membranes such as EPDM or PVC shall be avoided.

.4 Inverted roof configurations with insulation on top to protect the membrane are preferred wherever the geometry of the roof and the structural capacity of it will allow, and especially in areas of high traffic for mechanical system maintenance or for access to scientific instrumentation.

2.2 **Fire Inspector for Open Flame Roofing Activities’**

.1 Whenever a roofer is required to use an open flame as part of his roofing activities, a fire inspector shall be positioned full-time on the roof deck adjacent to the flame operation to assure safety on the roof. The inspector is to stay on the roof for a minimum of thirty minutes following extinguishing of last flame.

.2 Open flame roofing operations are not permitted on old wood decks.



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 52 00 Roofing

2.3 Roof Traffic Treads

- .1 Traffic treads shall be installed and integrated into membrane systems around all mechanical equipment including chimneys and ventilation exhaust shafts.

2.4 Clearance of Mechanical Equipment with Respect to the Roof Membrane

- .1 Mechanical equipment bases should be detailed to provide for easy access and maintenance of the membrane beneath the equipment. A minimum of 750 mm clearance should be provided, 900 mm is preferred.

2.5 Roof Drains

- .1 Two-piece mechanical drains, in which the upper sleeve is bolted to the lower sleeve, should be avoided. Loosened screws cause a persistent maintenance problem and promote roof leaks.
- .2 Gravel stops on roof drains should be plastic, not galvanized metal.

2.6 Metal Gravel Stops at Roof Edges

- .1 Traditional commercial details with metal gravel stops integrated into the roof membrane at the roof edge to provide a drip should be avoided. They cause premature wear of the membrane. The preferred detail is the creation of a small parapet to define a drainage basin with an interior roof drain.

2.7 Flashing Materials

- .1 Aluminium flashing materials are preferred over galvanized steel. Flashings on new roofs should be in aluminium.
- .2 Vent pipe covers should be in plastic instead of copper or metal.

2.8 Pitch Pockets

- .1 The preferred pitch pockets is the detail "Chem Curb System" as manufactured by Chem Link Inc. (1-800-826-1681) (www.chemlinkinc.com).

2.9 Access to Roof Decks and High Roofs

- .1 During design of roofing retrofits, consideration should be taken to assure adequate roof access to all roof decks or roof sections for maintenance purposes. The installation of catwalks and/or ladders should be provided as required.



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 52 00 Roofing

2.10 Cleaning Up after Completion of Roofing

- .1 Care should be taken to assure that all roof drains are cleaned at the end of a roofing project and that all construction materials are removed from the roof membrane surface.

2.11 Cleaning of Roof Drains

- .1 After completion of roofing and before leaving the site, the roofer will verify that the roof drain(s) operate and are free flowing all the way to the municipal sewer. The drain(s) will be flushed with a mechanical flush all the way to the exterior foundation wall of the building.

END OF SECTION 07 52 00



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 84 00 Fire-stopping

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying fire-stopping work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Comply with the requirements to applicable building codes.
- .2 All applications are valid only within a fire stopping system that meet the requirement of ULC-S115.
- .3 Select products and systems from recognized manufacturers that have been tested by one of the following agencies: Underwriters Laboratories (ULC and cUL), Warnock Hersey, or Omega Point Laboratory.

1.3 Guarantee

- .1 The products described in this section shall be guaranteed for a period of five (5) years from the date of substantial completion of the work.

Part 2 Products

2.1 Floor Sleeves

- 1. Metal sleeves are highly recommended for floor penetrations to protect contents on the floor below the penetration from leakage or flooding caused by pipe breaks, sprinkler discharge, etc. In deciding where floor sleeves will be required, the University Project Manager will evaluate the level of protection desired in the project and the likelihood of water damage. Require coordination by the fire-stop contractor with mechanical and electrical trades so that the proper fire-stopping systems are selected.
- 2. A firestop system with a "W" rating class I, is also acceptable when the installation of a sleeve is not possible.

2.2 Wall penetration with cable tray

- .1 Wall penetration with cable tray must be close with fire stop system for active openings using a fire stop product that is possible to remove and reinstall. Acceptable product: bloc FS657 or CP653 as manufactured by Hilti.



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DIVISION 07- THERMAL & MOISTURE PROTECTION

07 84 00

Fire-stopping

END OF SECTION 07 84 00



DIVISION 07- THERMAL & MOISTURE PROTECTION

07 92 10

Joint Sealing

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying joint sealing work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Always specify closed-cell polyethylene foam joint fillers, 30% oversized, with shape and density to provide optimum sealant performance.

Part 2 Products

2.1 Sealant

- .1 Sealant shall remain permanently elastic, non-shrinking, and non-migrating.
- .2 Sealant joint between window perimeter and masonry shall be of a chamfer joint shape.
- .3 Exterior sealant between aluminum frames and masonry shall be of ½" to ¾", chamfer form and polyurethane base. Specify "Dymeric 240" as manufactured by Tremco or approved equivalent.
- .4 Interior/exterior wood window sealer: "Tremco 830" as manufactured by Tremco, or approved equivalent.
- .5 Aluminum window sealant: "Dymonic" as manufactured by Tremco, or approved equivalent. (CAN/ONGC-19.13-M87)
- .6 Vertical expansion joint sealer: "Dymeric" as manufactured by Tremco, or approved equivalent. (CAN/ONGC-2.19.24-M80)
- .7 Acoustic sealer: "Tremco acoustic sealer" as manufactured by Tremco, or approved equivalent. (CAN/ONGC-19P21)
- .8 ULC sealer: "Fyre sil" or "Fyre shield" as manufactured by Tremco, or approved equivalent.

Part 3 Execution

- .1 Preparation and installation must follow manufacturer's recommendation.
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DIVISION 07- THERMAL & MOISTURE PROTECTION

07 92 10

Joint Sealing

END OF SECTION 07 92 10



08 03 11 Historic-Period Wood Doors

Part 1 General

1.1 Summary

- .1 In general follow the standards below when specifying historic wood doors. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 All modifications or replacement of Historic Doors must be review by the Architectural Advisory Committee
- .2 All exterior doors should be wood except where low traffic areas such as exit doors not normally operable. In these cases, steel exterior doors should be used. Thin veneer finishes are forbidden
- .3 The preferred material is solid oak or birch for staining.
- .4 For main entry door, aluminum exterior doors may be used. Review by the Architectural Advisory Committee is required before choosing any door other the original wood.
- .5 Refer to section 08 11 16 - Aluminum Doors & Frames.
- .6 The standard width for exterior door is 915mm and the minimal height is 2135mm.

Part 2 Products

2.1 Materials

- .1 Exterior wood doors shall be solid hardwood with 57 mm thickness.
- .2 The humidity rate shall be at 12% maximum.
- .3 Any veneer type construction must provide a minimum 13 mm thickness. Thin veneers are forbidden.
- .4 Specify factory finishes for transparent finishes. Factory finishes of adjacent wood frames is recommended to maintain consistent appearance.
- .5 Opaque finishes may be field painted but should be factory primed. Specify medium density overlay in lieu of wood veneers for opaque finishes.



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DIVISION 08- DOORS AND OPENINGS

08 03 11 Historic-Period Wood Doors

END OF SECTION 08 03 11



08 11 14 Metal doors and frames

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying Metal doors and frames. Unless otherwise indicated, these standards are not intended to replace professional judgment.

1.2 Design Requirements

- .1 The minimal width for all interior and exterior doors is 915 mm and the minimal height is 2,135 mm unless there are other constraints. Door heights should match the existing doors in that area.
- .2 The minimal width for all mechanical room doors is 1,200 mm. If the clearance is not wide enough for the door to open, specify two doors with one being 915mm of width and the other the width to complete the opening.
- .3 Interior frame configuration shall allow a minimum 150 mm between the edge of the frame and the adjacent wall on the hinge side to accommodate coat hooks and hangers behind the door.
- .4 Steel exterior door should be used only for low traffic areas such as exit doors not normally operable. All other exterior doors should be wood.
- .5 For service rooms, mechanical rooms or when a fire resistance of 45min or more is required, specify fire rated doors and frames with ULC labels.
- .6 For rooms with special acoustical requirements, specify doors and frames filled with acoustical insulation. Specify required hardware to meet acoustical needs.
- .7 Aluminium store front doors should be avoided whenever possible.

1.3 Guarantee

- .1 Certificate:
 - .1 Specify guarantee period of one year for metal doors and frames. Do not design doors which will void the guarantee because of oversized cut outs or insufficiently sized stiles and rails.



08 11 14 Metal doors and frames

Part 2 Products

2.1 Accessories

- .1 Specify 3 rubber stud bumpers per door leaf on the lockset jamb and 2 at the head of double doors. Type SR64as manufactured by "IVES" or approved equivalent.
- .2 Specify metal riveted Fire labels
- .3 Specify burglar proof glass bead.

2.2 Frame fabrication

- .1 Exterior frames and mechanical room frames: 1.6 mm welded type construction.
- .2 Interior frames at 1.2 mm welded type construction.
- .3 For all door frames wider than 915mm, specify a 1.9mm welded type construction.
- .4 Manufacturer's nameplates on frames and screens are not permitted.
- .5 Specify insulated exterior frame components with polyurethane insulation.
- .6 Specify reinforcement for hardware.

2.3 Frames: Welded Types

- .1 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .2 Spot welding is forbidden

2.4 Doors: Hollow Steel Construction

- .1 Exterior doors: Hollow steel construction on each face sheet from 1.6 mm sheet steel. The interior shall consist of rigid urethane, hot laminate and thermal resistance 0.7 m2 co/w. Factory finished with a coat of rustproof paint containing zinc chromate.
- .2 Interior doors: Hollow steel construction on each face sheet from 1.2 sheet steel.

2.5 Fire-rated Assemblies:

- .1 Provide units that are labelled and listed for rating indicated, by Underwriters' Laboratories.



DIVISION 08- DOORS AND OPENINGS

08 11 14 **Metal doors and frames**

2.6 Anchors and Accessories:

- .1 Manufacturer's standard units. Specify galvanized items for units built into exterior walls, complying with ASTM A 153.

Part 3 Execution

3.1 Installation-General

- .1 Specify labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Specify installation of doors and frames conforming to the CSDFMA Installation Guide.

END OF SECTION 08 11 14



08 11 16 Aluminum Doors & Frames

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying Aluminum Doors & Frames. Unless otherwise indicated, these standards are not intended to replace professional judgment.
- .2 This guide specification covers aluminum doors and frames intended for use principally as main entrance and vestibule doors, and for prominent interior doors from lobbies and similar spaces in buildings of public access where appearance is a major factor.

1.2 Design Requirements

- .1 All modifications or replacement of Historic Doors must be review by the Architectural Advisory Committee
- .2 The minimal width for all interior and exterior doors is 915 mm and the minimal height is 2,135 mm. Door heights should match the existing doors in that area.
- .3 All metal doors should have non removable pins.
- .4 Door head, base and central solid portion should have a width of 10" to 12". All jambs shall be 6".

END OF SECTION 08 11 14



08 14 10 Flush Wood Doors

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying wood doors. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 The minimal width for all interior and exterior doors is 915 mm and the minimal height is 2,135 mm.
- .2 Specify wood doors for offices, classrooms or when fire rated of 20min is required. Wood doors are to be avoided for laboratories.
- .3 Masonite veneer doors are to be avoided.

1.3 Guarantee

- .1 Certificate:
 - .1 Specify a guarantee for a period of ten (10) years for interiors wood doors. Do not design doors that will void the guarantee because of the oversized or insufficiently sized stiles and rails.

Part 2 Products

2.1 Wood Flush Door

- .1 Face Panels:

Hardwood; veneer grades. Face veneers shall be rotary cut Canadian White or Yellow Birch for stained and paint finishes unless noted otherwise. Do not specify exotic grades of wood with potentially long lead times and significant up charges.
- .2 Transom and Side Panels:
 - .1 Construction: match adjacent door.
 - .2 Meeting edges of doors and transom panels: square
 - .3 Specify veneer of transom panels to matched doors.



DIVISION 08- DOORS AND OPENINGS

08 14 10 Flush Wood Doors

- .3 Louvers and Light Frames
 - .1 Specify metal Louvers unless otherwise indicated.

2.2 Factory-Finishing

- .1 After completion, the outer faces of the door (upper and lower) must receive the same treatment as the lateral edges or a minimum of two coats of paint in order to avoid the absorption of humidity or to the exposure to extreme heat.

Part 3 Execution

3.1 Adjustment

- .1 After completion, the outer faces of the door (upper and lower) must receive the same treatment as the lateral edges or a minimum of two coats of paint in order to avoid the absorption of humidity or to the exposure to extreme heat.

END OF SECTION 08 14 10



08 33 36 Side Folding Grilles

Part 1 General

1.1 Summary

1. In general, follow the standards below when specifying toilet and bath accessories. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

1. Verify with the Project Manager the STC required for the folding partition.

1.3 Guarantee

1. The product described in this section shall be guaranteed for a period of five (5) years against fabrication or installation.

Part 2 Products

2.1 Materials

1. Frame shall be rust resistant pantographic frame consisting of 1.6 mm steel hinge plates, welded to 0.18 mm diameter vertical steel rods. Single row at bottom, intermediate rows at 1050 mm c.c., single row at top. Specify double row at top for doors over 3000 mm high. Encase high tensile alloy steel trolley pin on structural hinge plate channel.
2. Sound seals shall be flexible sweep strips at top and bottom of door and at lead post.

2.2 Track and Hanger Assembly

1. Track shall be extruded aluminium "C" channel track, pre-cut to door width, with accessories for recessed installation.
2. Specify hanger assembly and nylon-tire trolleys at every other hinge to support door and to allow for smooth and quiet operation.

2.3 Curtain Design

1. Shall be model "S-126B", as manufactured by Dynamic Closure, or approved equivalent.

END OF SECTION 08 33 36



08 35 14 Accordion Folding Doors

Part 1 General

1.1 Summary

- .1 In general follow the standards below when specifying work for folding doors. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Verify with the Project Manager the STC required for the folding partition.
- .2 Specify finishes with class A flame spread.

1.3 Guarantee

- .1 The products described in this section shall be guaranteed for a period of (2) two years against fabrication or installation. Pantographic frame, rails, and chariot for a period of ten (10) years from the date of substantial performance of the work.

Part 2 Products

2.1 Materials

- .1 The assembly shall be a joining pair of fixed-jamb partitions that attach and stack at opposite jambs and join in the center.
- .2 Panels shall be specially laminated engineered wood core, bonded with water-resistant plastic glue and surfaced with Walnut wood veneer.
- .3 Panels shall be hinged and edge sealed with heavy-duty, dual wall, flame resistant, extruded vinyl. Hinges shall be securely locked into and protect the panel edges. They shall provide "memory-action" causing panels to extend and stack equally, smoothly and quietly. Color shall be brown
- .4 Hardware shall include handles, touch-bar automatic latches and all necessary screws and fasteners

2.2 Track and Hanger Assembly

- .1 Track shall be extruded aluminum, surface mounted, decorated type.



DIVISION 08- DOORS AND OPENINGS

08 35 14 **Accordion Folding Doors**

- .2 Specify hanger assembly with two wheels suspended on alternate panels. A four wheel truck hanger shall be installed on each end post. Wheels shall be ball-bearing.

2.3 Accordion Folding Partitions

- .1 For STC 25 to 30, accordion partition shall be manually operated, "Scale /6", wood type as manufactured by Panelfold Canada Inc. or other approved equivalent.

END OF SECTION 08 35 14



08 35 15 Acoustical Folding Doors

Part 1 General

1.1 Summary

- .1 In general follow the standards below when specifying work for folding doors. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Verify with the Project Manager the STC required for the folding partition.
- .2 Specify finishes with class A flame spread.

1.3 Guarantee

- .1 The products described in this section shall be guaranteed for a period of (2) two years against fabrication or installation. Pantographic frame, rails, and chariot for a period of ten (10) years from the date of substantial performance of the work.

Part 2 Products

2.1 Materials

- .1 Acoustical folding partition shall be composed of rigid twin wall panels, high pressure laminated with manufacturer's standard finishes and colors. These twin wall panels shall be 100 mm (4") wide and be connected by a sturdy extruded vinyl interior hinging system. The acoustical folding partitions shall be provided with fixed top and bottom sweep seals. The closing seal shall be assured by polished aluminum handles and jambs.

2.2 Track and Hanger Assembly

- .1 Shall be heavy-duty extruded aluminum having the same length as the opening including all necessary hardware pertaining to its installation. The track shall be concealed by wooden head mouldings. The lead posts shall be supported by a nylon capped, steel ball-bearing four-wheel carriers and the twin panel modules shall be supported by a nylon capped, steel ball-bearing two-wheel carrier.

2.3 Panel finishes

- .1 Shall be "Beach" color vinyl with "Off White" color hinges.



DIVISION 08- DOORS AND OPENINGS

08 35 15 Acoustical Folding Doors

2.4 Acoustical Folding Partitions

- .1 For STC 42 to 50, accordion partition shall be laminated panels, "Sonicwal 66", as manufactured by Panelfold Canada Inc. or equivalent manufactured by Corflex or other approved equivalent.

END OF SECTION 08 35 15



08 50 50

Windows

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying window. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 The Architectural Advisory Committee must review all modifications or replacement of windows.
- .2 All replacement of existing windows should be specified to match the existing windows except when noted otherwise.
- .3 Determine with Project Manager the following:
 - .1 The necessity for operable window versus fixed windows shall be considered in conjunction with the HVAC system and security requirements.
 - .2 If window is operable, determine the necessary size of operable area and the allowable operability. Consider types of hardware for operable windows and necessity for stoppers and keys to lock windows.
 - .3 If window is operable, determine the possibility and necessity of integrating mosquito screens.
 - .4 Operation and maintenance of windows shall be coordinated with building director and director of operation through the Project manager.
- .4 Integrate window design with building insulation and roofing system to maximize energy efficiency. Also, window system must meet, and, if possible, exceed requirements by ASHRAE 90.1-2007 - Building Envelope for local climate zone (Zone 5).
- .5 All new windows shall conform with CAN/CSA-A440, and meet the following minimum level of performances for fixed or operable windows (except double hung):
 - .1 Air infiltration factor: higher or equal than A3
 - .2 Water infiltration factor: higher or equal than B7
 - .3 Wind load resistance: higher or equal than C5
 - .4 Resistance to condensation: higher or equal than I 55
- .6 For all old buildings, particular attention has to be given to condensation problems if there is not enough circulation of air (heating source) coming at the base of the window. (higher I factor (condensation resistance) is required);



08 50 50 Windows

1.3 Guarantee

- .1 The products described in this section shall be guaranteed for a period of five (5) years from the date of substantial completion of the work.

Part 2 Products

2.1 Materials

- .1 Specify thermally improved (thermal-break) construction in all cases, without exception.

2.2 Aluminium Finishes

- .1 Finish to be DURANAR or approved equivalent.
- .2 Standard color choices for **some** McGill buildings windows are either "Commercial Brown" or oxidized copper colour equivalent to 4173-53 or EX106.
- .3 Finishes must be reviewed by the Architectural Advisory Committee.

2.3 Isolation Coating

- .1 Isolate aluminium from following components, by means of isolation coating as follows:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area;
 - .2 Concrete, mortar and masonry;
 - .3 Wood.

2.4 Sealed unit:

- .1 Hermetically sealed unit with basic components:
 - .1 Glazing of 6mm;
 - .2 Gas space (argon) of 12.7mm with non-conductive spacer;
 - .3 Acceptable product: "R-Max" as manufactured by Prelco or approved equivalent;
 - .4 Glazing of 6 mm.

2.5 Glazing

- .1 Shall be factory sealed thermopane units with clear glass. Use of tints, reflective coatings, and other possible combinations must be reviewed by the Architectural Advisory Committee.
- .2 The U value of the assembly shall be lower than the maximum U value mentioned listed in ASHRAE 90.1-2007 (U=0, 24 or better)



08 50 50

Windows

- .3 Visible light or transmittance (%):
 - .1 Specify the maximum possible to save on indoor lighting, and no less than 63% transmittance. (For reference, clear glass thermos unit has a transmittance=78%)
- .4 Solar Heat Gain Coefficient (SHGC):
 - .1 The SHGC value of the assembly has to be lower than the maximum SHGC value mentioned listed in ASHRAE 90.1-2007 (0, 42 or better).
- .5 Low E coating
 - .1 Should be use in position 2 or 3 to control Heat loss or Heat gain (accordingly) through windows if required. 'Soft coating' type of Low-E, applied by vacuum deposition is preferred. Degrees of low E are to be chosen according to characteristics needed, depending on the case. (Color, transmittance and reflectivity are factors to look at). Acceptable products: "Low E 272" on clear or "Low E 366" on clear as manufactured by Cardinal or approved equivalent;
- .6 Tempered or annealed glass to be determined on each specific project.
- .7 Muntins added on sun exposed high performance glazing create a differential in temperature in the glass that can make it cracked: tempered glass might be necessary.

2.6 Hardware

- .1 Hardware: stainless steel or white bronze sash locks and aluminium handles to provide security and permit easy operation of units
- .2 All operable hardware, hinges, handles, pulls, etc. shall be heavy duty.

2.7 Air Barrier / Vapour Retardant

- .1 Equip window frames with (factory site) installed air barrier and vapour retardant material for sealing to building air barrier and vapour retardant as follows:
 - .1 Material: identical to, or compatible with, building air barrier and vapour retardant materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retardant from interior.

2.8 Sealant: (Refer to Section 07 92 10 – Joint Sealing)

- .1 Sealant shall remain permanently elastic, non-shrinking, and non-migrating.



DIVISION 08- DOORS AND OPENINGS

08 50 50 Windows

- .2 Sealant joint between window perimeter and masonry shall be of a chamfer joint shape. Exterior sealant between aluminum frames and masonry shall be of ½" to ¾", chamfer form and polyurethane based. Acceptable product: "Dymeric 240" as manufactured by Tremco or an approved equivalent.

2.9 Glass-Fibre Mesh Insect Screen:

- .1 Specify 18 by 16 or 18 by 14 mesh of plastic-coated glass-fibre threads, woven and fused to form a fabric mesh that is resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with requirements of ASTM D 3656.

Part 3 Execution

3.1 Testing

- .1 InSitu tests have to be specified and executed after windows are installed to verify values asked.

END OF SECTION 08 50 50



DIVISION 08- DOORS AND OPENINGS

08 71 10

Hardware

Part 1 General

1.1 Summary

1. In general, follow the standards below when specifying hardware work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 McGill must approve finishes and models.
- .2 Medeco keys and cylinders shall be supplied and installed by the Contractor. The codes are provided to the contractors by McGill Security and the hardware is supplied directly from Medeco to the contractor by authorization of an official letter from McGill.
- .3 In the case of classrooms containing audio-visual equipment, provide a "card reader" for each door serving this room. No restrictions to leave the room.
- .4 In the case of hardware replacement, refer to the existing hardware and finishes as much as possible.
- .5 A Canadian Certification Organization accredited by Standards Council of Canada shall certify hardware for doors in fire separations and exit doors.
- .6 Interior electromagnetic locks are restricted in use. Accepted in limited circumstances through consultation with Security and Fire Prevention Services.
- .7 When renovating a selected area and changing locks, change to Medeco if not already in use.
- .8 For historical door hardware, dark bronze color and material is preferred to brass.

1.3 Guarantee

- .1 Guarantee is required for all work under this section for a period of one (1) year from the date of Substantial Performance of the work, exception for the door closers that is guaranteed for 10 years, cylindrical locks and exit devices for a period of 3 years.

Part 2 Products

2.1 Door Hardware

- .1 Locks and Latches:
-



DIVISION 08- DOORS AND OPENINGS

08 71 10

Hardware

- .1 Specify cylindrical type, lever handle lock and latch sets equipped with Medeco type lock cylinders, in a master key system to be designed by Owner. With each lockset, furnish companion strike as indicated, for installation on doorjamb.
- .2 Keying is the responsibility of McGill University; and shall be installed by the Contractor and by Facilities.
- .3 Contact the Project Manager for questions concerning keying and key sections.
- .4 Manufacturer/Model of Lock/Latch Sets: Specify the following units, or equivalent products of Corbin CL 3300 and Corbin ML2000 series for small renovations in existing buildings.
 - .1 Office Lockset: CL3351-NZD-626
 - .2 Classroom Lockset: CL 3355-NZD-626, for higher security levels
 - .3 Passage Lockset: CL3310-NZD-626
 - .4 Service/Store Room Lockset: CL3357-NZD-626
 - .5 Privacy lockset: CL3320-NZD-626
 - .6 Mechanical Room/ Telecom Room/ Elev.+Service Room: CL3310-NZD-626 with Deadlock DL3017 by Corbin
- .2 Strike Plates:
 - .1 Specify handed-type strike plates with curved lip; flat (non-handed) strikes are not permitted.
 - .1 Specify strike plates with extended lips where required to protect doorframe and trim from being marred by latch bolt. Specify strike plates that project not more than 1/8 inch beyond doorframe trim at single doors; and flush with face of doors at double (pair) door applications.
 - .2 Specify custom-fabricated strike plates at existing doorframes if required for compatibility with new lockset or latch set units. Fabricate units of base metal and finish specified. Specify units manufactured by CBH or equivalent.
 - .2 Manufacturer/Model of Cylinders: Specify cylinders by the following manufacturer.
 - .1 Medeco, unless otherwise specified.
- .3 Construction Locks:
 - .1 In each door, specify temporary cylinders, installed simultaneously with the lock.
 - .1 Temporary cylinders shall remain for the duration of construction.
- .4 Butts and Hinges:
 - .1 Interior Hinges:
 - .1 For all light and medium traffic doors such as classrooms, offices, storage rooms, utility rooms, doors that require door closers such as fire rated classrooms and office doors, reasonable traffic washrooms and



DIVISION 08- DOORS AND OPENINGS

08 71 10

Hardware

- stairway doors, etc., shall be Medium-Duty (2 ball bearings per hinge) type BB1279 by "Hager", or approved equivalent.
- .2 For all heavy traffic doors that require door closers, such as exterior doors, student washrooms, high traffic stairways (those in buildings with no elevators), etc., shall be Heavy-Duty (4 ball bearings per hinge) type BB1168 by "Hager", or approved equivalent.
- .2 Exterior Hinges:
 - .1 Hinges: shall be type BB-1191 by "Hager" N.R.P. (non removable pin)
 - .2 Specify 5-knuckle, 2 ball-bearing hinges; swaged; inner leaf bevelled; with square corners; non removable pin, complete with set screw (knurled pin not acceptable); and as follows:
- .3 Finish: To match "Finish of Hardware" requirements of this Section.
- .4 Size and Weight: Specify hinges sized and quantity as follows:
 - .1 Doors not wider than 3 feet nor taller than 7 feet 6 inches:
 - .1 3 hinges Size: 4-1/2 inches by 4 inches.
 - .2 Doors not wider than 3 feet nor taller than 7feet 6 inches for heavy traffic
 - .1 4 hinges Size: 4-1/2 inches by 4 inches.
 - .3 Doors wider than 3 feet or taller than 7 feet 6 inches:
 - .1 4 hinges Size: 5 inches by 4 inches.
 - .4 Doors wider than 3 feet or taller than 7 feet 6 inches for heavy traffic
 - .1 4 hinges Size: 5 inches by 4 inches.
 - .5 Doors 1-3/8 inches thick and not wider than 3 feet nor taller than 7 feet:
 - .1 4-1/2 inches by 4 inches.
- .5 Exit Devices:
 - .1 Auxiliary item(s): door co-ordinator, type 21, for pairs of doors with overlapping astragals and carry bar when applicable.
 - .2 Non-Fire-Rated concealed Mounted Vertical Rod Type Exit Device:
 - .1 For use on pairs of doors Concealed mounted, vertical rod type units activated by a partial-width touch-bar, complete with accessories including strike. Equip units with Cylinder key operated dogging device mounted on mechanism housing to hold the touch-bar depressed and the latch bolt in the retracted position.
 - .2 Manufacturer/Model of Exit Devices: Von Duprin model CD9848NL, 990NL-V trim.
 - .3 Manufacturer/Model of Exit Devices: Von Duprin model CD9848DT, 990DT trim.
 - .4 Manufacturer/Model of Exit Devices: Von Duprin model 9848EO.
 - .5 Manufacturer/Model of Exit Devices: Von Duprin model CD9848L-17, 996L-R/V trim. Level design to be approved.



DIVISION 08- DOORS AND OPENINGS

08 71 10

Hardware

- .6 LBR, less bottom rod Exit device option to be considered on openings with non-security applications; Example: Corridor egress doors.
- .3 Fire-Rated Concealed Mounted Vertical Rod Type Exit Device:
 - .1 Fire-rated, ULC listed, concealed mounted, vertical rod type units activated by a partial-width touch-bar, complete with accessories including strike.
 - .2 Manufacturer/Model of Exit Devices: Von Duprin model 9848NL-F, 990NL-V trim.
 - .3 Manufacturer/Model of Exit Devices: Von Duprin model 9848DT-F, 990DT trim.
 - .4 Manufacturer/Model of Exit Devices: Von Duprin model 9848EO-F.
 - .5 Manufacturer/Model of Exit Devices: Von Duprin model 9848L-F-17, 996L-R/V trim with optional no. 17 lever. Level design to be approved.
 - .6 LBR, less bottom rod Exit device option to be used on openings with non-security applications; Example: double-egress corridor fire-rated doors.
- .4 Non-Fire-Rated Mortise Type Exit Device:
 - .1 Surface mounted, vertical rod type units activated by a partial-width touch-bar, complete with accessories including strike. Equip units with Cylinder key operated dogging device mounted on mechanism housing to hold the touch-bar depressed and the latch bolt in the retracted position.
 - .2 Manufacturer/Model of Exit Devices: Von Duprin model 9875L, 996L-M trim, and with optional no. 17 lever. Level design to be approved.
- .5 Fire-Rated Mortise Type Exit Device:
 - .1 Fire-rated, ULC listed; mortise type units activated by a partial-width touch-bar, complete with accessories including strike.
 - .2 Manufacturer/Model of Exit Devices: Von Duprin model 9875L-F, 996L-M trims, and with optional no. 17 lever. Level of design to be approved.
- .6 Door Closers:
 - .1 Door co-ordinator: [surface] [concealed] for pairs of doors with overlapping astragal, when applicable.
 - .2 Specify closers with field-adjustable, full-range sizing feature capable of complying with manufacturer's size recommendations for application indicated; and complying with applicable portions of the Americans with Disabilities Act (ADA).
 - .3 Specify "cush" units with Cush shoe support, when applicable.
 - .4 Unless otherwise indicated, mount closer bodies on room side (not corridor side) of doors. Refer doubtful conditions to Architect for decision.



DIVISION 08- DOORS AND OPENINGS

08 71 10 Hardware

- .5 Double-acting Closer/Pivot Sets or double acting spring hinges.
 - .1 To be discussed
- .6 Interior Closers:
 - .1 Door Closers:
 - .1 For regular access doors shall be Heavy-Duty type LCN 4041 689 finish.
 - .2 For handicap access doors shall be type LCN P4041 DA 689 finish.
- .7 Exterior Closers:
 - .1 Door Closers:
 - .1 For regular interior swing doors up to 915 mm (36") wide shall be type LCN 4014 689 finish.
 - .2 For regular exterior swing doors up to 915 mm (36") wide shall be type LCN 4114 689 finish.
 - .3 For regular interior swing doors up to 1066 mm (42") wide shall be type LCN 4015 689 finish.
 - .4 For regular exterior swing doors up to 1066 mm (42") wide shall be type LCN 4115 Spring-Cush 689 finish.
 - .5 For handicap interior swing doors up to 915 mm (3'-0") wide shall be type LCN 4014 DA 689 finish.
 - .6 For handicap exterior swing doors up to 915 mm (3'-0) wide shall be type LCN 4114 Spring-Cush DA 689 finish.
 - .7 For handicap doors over 915 mm (3'-0) wide shall be type LCN P4041 DA 689 finish.
- .7 Door Operators:
 - .1 Power assist and low energy power operated doors: to CAN/CGSB-69.35.
 - .2 General: Of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
 - .1 Type: Low-energy power operated, complying with ANSI/BHMA A156.19.
 - .2 Connections: For power and control wiring.
 - .3 Adjustment Features: Fully adjustable without removing entrance doors, including
 - .4 On/Off Feature: On/off/hold-open switch controls electric power to operator.



DIVISION 08- DOORS AND OPENINGS

08 71 10 Hardware

- .3 Electromechanical Operators: Self-contained overhead units, with closing speed controlled by gear train and dynamic braking action of electric motor and with manual operation and spring closing when power is off.
 - .1 Closing Mechanism: Power-assisted spring operated.
 - .2 Mounting: Surface, otherwise specified.
 - .3 Manual Operation: Requires less than 9 lbf to set door in motion when power is off, according to ANSI/BHMA A156.10.
- .4 Manufacturer/Model No. of Door Operator: Stanley Magic Force, finish 689. Including all necessary accessories Ex: Wall mounted plate actuators, motion sensors and/or presence detectors.
- .8 Architectural Door Trim:
 - .1 Push plates shall be 100 mm x 405 mm (4" x 16") stainless steel type 30S by "Hager" or approved equivalent. Pulls shall be H34J by Hager
 - .2 Push /Pull Set:
 - .1 Specify pull handles and push plates with concealed mounting fasteners wherever possible, and as follows:
 - .2 Material: Solid stainless steel.
 - .3 Finish: Satin.
 - .4 Manufacturer/Model of Push/Pull Set: Subject to compliance with requirements, specify the following, or equivalent products of Ives, CBH, and Hager in 630 finishes.
 - .1 Push Plates: Example Ives; No. 8200 (4 inches by 16 inches).
 - .2 Pulls: Examples Ives; No. 8303-0 (10 inches by 1 inch diameter.; (4 inches by 16 inches) base plate.
- .9 Auxiliary Hardware:
 - .1 Interior Coded Locks:
 - .1 Shall be Kaba Ilco Unican, type Simplex L1000, with lever with Medeco key plug (distributed by Agence clé 974-7415) (supplied and installed by the Contractor & keyed by McGill).
 - .2 Exterior Coded Locks: Non Acceptable
 - .3 Interior Electromagnetic Lock: (restricted use)
 - .1 shall be Model 350+ by Locknetics or approved equivalent, voltage 12V.
 - .4 Exterior Magnetic Contact:
 - .1 shall be supplied and installed by McGill.
 - .5 Electric Strikes:
 - .1 Shall be series Type S/L6514 – S/L6508 by Rutherford controls INT'L or approved equivalent, voltage 12V.
 - .6 Card Access:



DIVISION 08- DOORS AND OPENINGS

08 71 10 Hardware

- .1 Shall be supplied and installed by McGill.
- .2 Consultants shall provide the wiring schema.
- .7 Automatic Door Bottom/ Door Bottom Seal
 - .1 Specify manufacturer's standard units of type, size and profile indicated, continuous at bottom of indicated door opening. Specify non-corrosive fasteners.
 - .2 Manufacturer/Model Automatic Door Bottoms:
 - .1 shall be Pemko; No. 434 RL for mortise;
 - .2 Hagar 743SA for new doors;
 - .3 Pemko 430RL for surface mounted and
 - .4 Hagar 747 SX for existing doors (surface mounted) or equivalent products of Unique, Zero.
- .8 Electrically Activated Hold-Open Device.
 - .1 Specify units consisting of a silently operating wall-mounted electromagnet in electrical box with cover plate and door-mounted contact plate. Specify contact plate with swivel adjustment that adjusts to door contact angle indicated on drawings. Specify units that ULC listed.
 - .2 Minimum holding force: 25 lbs.
 - .3 Operating Voltage: 24 V. DC or 120V.
If the above is required to be activated/deactivated by LENEL, the Voltage need to be confirmed. LENEL usually takes 12V
 - .4 Finish: Brushed zinc on all visible components.
 - .5 Manufacturer/Model: LCN model 7830 (surface-mounted).
 - .6 Manufacturer/Model: LCN model 7840 (recessed).
- .9 Door silencer:
 - .1 Specify manufacturer's standard profile silencers of 1/8-inch thick hard rubber for metal door frames as follows:
 - .2 Manufacturer: Ives-SR 64
- .10 Roller latch:
 - .1 Forged bronze roller latches with rubber roller.
 - .2 Furnish units designed to be mortised into door, and with adjusting screws on face of latch. With each roller latch, furnish companion strike for installation on jamb.
 - .3 Manufacturer/Model of Roller Latches: Ives no. RL-32.
- .11 Stops: Reinforce the substrate as recommended.
 - .1 Colour of resilient parts: Grey
 - .2 Manufacturer / model of stops: Ives model indicated or equivalent products of CBH, Stanley, and Ives.
 - .1 Model no: FS436 (floor mounted for wood doors)



DIVISION 08- DOORS AND OPENINGS

08 71 10

Hardware

- .2 Model no: FS436 with riser 435 (floor mounted for steel doors)
- .3 Model no: FS444 (floor mounted, limited door bottom clearance)
- .4 Model no: WS406 (wall mounted, with applicable anchors)
- .5 Model no: WS407: (wall mounted, with applicable anchors)
- .6 Model no: FS1153 Plunger type door holder
- .7 Model no: FS452 Kick down holder
- .8 Specify concealed overhead doorstops that attach to top of the door and to the doorframe.
- .9 Provide a nailing board for drywall installations
- .10 Manufacturer/Model of Overhead Door Stops/ Holders: Glynn-Johnson model no. 100S or H.
- .12 Manual/Automatic flush bolts:
 - .1 Manual Flush Bolts: Mortise units, ULC listed and rated for indicated application, with spring loaded snap action levers for manual operation.
 - .2 Manufacturer/Model of Manual Flush Bolts: Specify Ives or equivalent products as follows:
 - .1 Metal Doors: FB458, both top and bottom bolts.
 - .2 Wood Doors: FB358, both top and bottom bolts.
 - .3 Constant Latching Flush Bolts: Mortise units, ULC listed and rated for indicated application, with automatically retracting bottom bolt, and manually released top bolt when active leaf is opened.
 - .4 Manufacturer/Model of Constant Latching Flush Bolts: Specify Glynn-Johnson, or equivalent products of H.B., Ives.
 - .1 Metal Doors: FB51P set, (FB51T top and FB31B bottom bolt).
 - .2 Wood Doors: FB61P set, (FB61T top and FB41B bottom bolt).
 - .5 Automatic Flush Bolts: Mortise units, ULC listed and rated for indicated application, automatically retracting when active leaf is opened.
 - .6 Manufacturer/Model of Automatic Flush Bolts: Specify Glynn-Johnson, or equivalent products of H.B., Ives.
 - .1 Metal Doors: FB31P, both top and bottom bolts.
 - .2 Wood Doors: FB41P, both top and bottom bolts.
- .13 Coordinator: Device coordinating pair of doors with astragals ensuring proper closing sequence. Specify coordinators complete with carry-bar and UL listed and rated for indicated application.
 - .1 Manufacturer / model of coordinator: Ives or equivalent, and as follows:
 - .1 Model: COR-7G, 7 inch projection or COR-65 as manufactured by "Glynn-Johnson"
 - .2 Model: COR-9G, 9 inch projection or COR-85 as manufactured by "Glynn-Johnson"



DIVISION 08- DOORS AND OPENINGS

08 71 10 Hardware

- .3 Carry bar if required.
- .10 Thresholds
 - .1 Specify manufacturer's standard, extruded, anodized aluminium units of type, size, and profile indicated. Specify units continuous across bottom of door openings.
 - .1 Specify noncorrosive fasteners.
 - .2 Manufacturer/Model: Pemko No. 277AS, or equivalent products of Hager, Zero or Unique.
 - .3 With thermal break for exterior doors
- .11 Weather-stripping
 - .1 Weather stripping: Shall be installed continuously at both jambs and at the head with heavy-duty strips consisting of cellular neoprene bars set into extruded aluminium bumpers, surface-mounted to frames.
 - .2 Head and jamb seal:
 - .1 Specify manufacturer's standard weather-stripping of type, size and profile indicated, continuous at head and jamb edges of each indicated door opening. Specify non-corrosive fasteners.
 - .2 "CR" suffix below is for clear anodized aluminium finish. change to "DR" suffix for dark bronze anodized aluminium finish.
 - .3 Manufacturer/Model Jamb Seals: Example Pemko; No. 315CR, or equivalent products of Zero or Unique.
 - .4 Specify manufacturer's standard sound attenuating jamb and head seals of type, size, and profile indicated, continuous at head and jamb edges of scheduled door openings. Specify units with noncorrosive fasteners.
 - .5 Manufacturer/Model: Pemko No. 350 CSR, or equivalent products of Hager Zero or Unique.
 - .3 Door bottom seal:
 - .1 Specify manufacturer's standard weather-stripping of type, size and profile indicated, continuous at bottom edges of each indicated door. Specify non-corrosive fasteners.
 - .2 Suffix below is for clear anodized aluminium finish. Change suffix to "d" for dark bronze anodized aluminium.
 - .3 Manufacturer/Model door bottom seals: Example Pemko; No. 18062C, or equivalent products of Hager, Unique or Zero.
- .12 Astragal
 - .1 Manufacturer/Model of Astragals: Example Pemko; No. 357SP, or equivalent products of Hager, Unique or Zero.
 - .2 100A Pile & Repile of Unique



DIVISION 08- DOORS AND OPENINGS

08 71 10 Hardware

- .13 Fastenings
 - .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
 - .2 Exposed fastening devices to match finish of hardware.
 - .3 Use fasteners compatible with material through which they pass.
- .14 Keying
 - .1 For less than 5 doors, the keying will be done by McGill.
 - .2 For more than 5 doors, keying shall be included in the contractor's mandate.
- .15 Kick plates
 - .1 Specify solid metal units as follows:
 - .1 Material: Stainless steel.
 - .2 Finish: Satin.
 - .3 Size: 1 1/2 inches less than door width on push side, 1/2 inch less than door width on pull side, by 0.050-inch thick or otherwise.
 - .4 Manufacturer/Model of Kick plates: Example Ives, Series 8400 x B3E x double-sided adhesive-backed high-bond tapes x 254MM high. S32D finish.

Part 3 Execution

3.1 Installation-General

- .1 General: Install each hardware item to comply with manufacturer's printed installation instructions and recommendations for application indicated, unless otherwise indicated by referenced standard or by provisions of this Section.
- .2 All dead locks shall be installed at 1 220 mm from floor, except for mechanical rooms.

END OF SECTION 08 71 10



08 80 50 Glazing

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying glazing and related items. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Exterior Glazing
 - .1 Specify 1-inch thick, low-e coated, argon gas filled insulating glass in all vertical vision glass panels. Where spandrel glass is used, do not specify units with insulation board adhered to inside surface. Where metal filler panels are used, specify the 1-inch thick aluminium sandwich panels with rigid insulation core. Also, refer to Section 08 50 50 – Windows, Part 2.2.4
- .2 Interior Glazing
 - .1 All interior doors that require glazing shall be glazed with 6 mm (1/4") clear and/or frosted, tempered glass set in continuous gaskets on both sides.
 - .2 All fire rated exit doors that require glazing shall be glazed with 6 mm (1/4") polished wire glass and set in continuous gaskets on both sides and shall not rattle when door is slammed.
 - .3 Interior windows shall consist of tempered glass panes. Glass shall be clear, 6 mm (1/4") thick, free of distortions, polished plate or float, with neoprene setting blocks and glazing tape.

1.3 Guarantee

- .1 Guarantee is required for all work under this section for a period of ten (10) years from the date of substantial completion of the work.

Part 2 Products

2.1 Transparent Mirror glass

- .1 Shall be "Mirropane T.M." by Pilkington, or approved equivalent.

2.2 Red film for animal facilities

- .1 Shall be "Rose red" as distributed by Pelti Vitres teintées, or approved equivalent.

END OF SECTION 08 80 50



09 21 16 Gypsum Board Assemblies

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying gypsum board assemblies. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Design non-load bearing partitions in accordance with steel stud and drywall manufacturer's published recommendations regarding stud depth and gage for each application.
- .2 Steel studs shall be spaced at 305mm c/c for all partitions and should be detailed to support shelving. Shelves shall be anchored to studs
- .3 Incorporate plywood sheet backing into gypsum board partitions where required to support equipment or furnishings, and as otherwise deemed necessary by the Project Manager.
- .4 Clearly mark fire-rated assemblies on drawings with required fire rating in hours.
- .5 Design assemblies to provide sound control ratings as following or established by the program or by the Project Manager.
 - .1 Executive Offices: shall extend to the underside of the slab and be insulated. (minimum STC 52)
 - .2 Washrooms: shall extend to the underside of slab and be insulated. (minimum STC 47) If washroom is located next to an office &/or classroom, minimum STC 52 required.
 - .3 Classrooms: shall extend to the underside of slab and be insulated. (minimum STC 52)
- .6 Plastic trim is not acceptable.

Part 2 Products

2.1 Material Requirements

- .1 Gypsum: Usually specify gypsum board for partition applications a minimum of 16 mm thick; and for suspended ceilings, soffits and fascias a minimum of 13 mm thick. Thinner units are acceptable where required for bending, compliance with ULC design requirements, or other design requirements.



09 21 16 Gypsum Board Assemblies

- .2 Steel Supports: Galvanized, and as follows:
 - .1 Studs: C-shaped, punched, and not less than 22 gage minimum thickness.
- .3 For areas subject to abuse or high traffic where concrete block walls are not desired, partitions may be assembled with Portland cement fibre panels 16 mm thickness as "Fibre Rock VH1" as manufactured by CGC, or approved equivalent.
- .4 Gypsum for walls in washrooms shall be water resistant.

END OF SECTION 09 21 16



09 22 27 Suspended Ceilings

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying suspended ceilings work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Suspended ceilings are forbidden in all washrooms, except under special request approved by the Project Manager. In this case, the suspended ceiling shall be water resistant and washable.
- .2 Where ceiling-mounted items obstruct the regular spacing of hanger wires, design "trapeze" structures with additional steel supports to bridge the obstruction.

Part 2 Products

2.1 Acoustic Panels

- .1 Circulation, public areas, offices and laboratories:
 - .1 Ceiling tiles: Shall be 610 mm x 1220 mm (24" x 48") "Fissured" #755 mineral fibre acoustical lay-in panels as manufactured by Armstrong or 610 mm x 610 mm (24" x 24") Fissured #756 mineral fiber acoustical lay-in panels as manufactured by Armstrong (see drawings for exact sizes) , or approved equivalent. Panels shall be 16 mm (5/8") thick with a flame spread index Class 25.
 - .2 Framing: Shall be 28 gauge, cold-rolled steel Tees, 38 mm (1 1/2") high with 25 mm (1") flanges. Tees shall be galvanized and prefinished on exposed surfaces in baked-enamel, white. Main Tees shall be installed at 1220 mm (4'-0") centre and fastened to wire hangers. Cross Tees shall be installed at 610 mm (2'-0") centres
- .2 Animal facilities, clean rooms and food service areas:
 - .1 Shall be 610 mm x 1220 mm (24" x 48") VL #870 mineral fibres lay-in panels as manufactured by Armstrong, or approved equivalent. Panels shall be 16 mm (5/8") thick with a flame spread index Class 25 or under.
 - .2 Framing: Shall be as "Prelude" by Armstrong model ALXL, with clips # 414, or approved equivalent. The perimeter of light fixtures shall be sealed with latex silicone.



09 22 27 Suspended Ceilings

2.2 Edge Molding

- .1 Shall be 28 gauge, cold-rolled steel angles, 38 mm (1 1/2") high with 25 mm (1") flanges. Angles shall be galvanized and prefinished on exposed surfaces in baked-enamel, white.

2.3 Hangers

- .1 Shall be 3.6mm diameter, hot-dipped galvanized, mild steel wire anchored to structure above at 1220 mm (4'-0") centres in both directions.

2.4 Replacement materials

- .1 For projects under \$1,000,000.00, do not request to the general contractor the 2% of surplus replacement materials.

END OF SECTION 09 22 27



09 30 13 Ceramic Tiling

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying ceramic tiling work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Specify ceramic tile flooring with a 100 mm cove bases for the following building areas:
 - .1 Washrooms: avoid light colours for floors and base.
 - .2 Janitors closet.
- .2 Specify ceramic tile wall for the following building areas:
 - .1 Washrooms: 1820 mm high from floor.
- .3 Grout
 - .1 Avoid light colours for grout. Specify grout for the particular application conditions. Stain-resistant or acid-resistant grout materials shall be used for tile surfaces subject to heavy use or chemical exposure.
- .4 Sealer
 - .1 Specify base sealers to grout on washroom walls and floors. Request a maintenance manual, including information on sealing grout on floors and walls.
- .5 Recycled content ceramic tile is preferred.

Part 2 Products

2.1 Material requirements:

- .1 For projects under \$500,000.00, do not request to the general contractor the surplus 2% for replacement.
- .2 Specify ceramic tile for intensive usage and safe for users.
- .3 Saddles: Shall be imported white marble 16 mm thick with bevelled edges.

END OF SECTION 09 30 13



09 65 16 Resilient Sheet Flooring

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying resilient sheet flooring work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Laboratories: Specify sheet vinyl floors with heat welded seams and integral, cove base to contain spills in laboratories.
- .2 Common areas: Specify sheet linoleum floor with heat welded seams with standard maple hardwood baseboard.
 - .1 Maple hardwood baseboard shall be "Select category", 102 mm high and with a thickness of 16 mm, varnished finish applied in shop.
- .3 Entrances: Do not specify linoleum or carpet within 10m of entrances to buildings.

1.3 Guarantee

- .1 The products described in this section shall be guaranteed for a period of five (5) years from the date of substantial completion of the work.

Part 2 Products

2.1 Resilient sheet flooring

- .1 Laboratories: Shall be 2 mm thick, "Optima" as manufactured by Tarkett or approved equivalent as manufactured by Mannington or other approved equivalents, with welded rods.
- .2 Common areas: Shall be 3 mm thick linoleum, "Marmoleum" series as manufactured by Forbo, or approved equivalent, with welded rods.

2.2 Material Requirements

- .1 In all cases where spillage is possible, caulk around all new and existing through floor pipe and sleeve penetrations. Coordinate sealing with mechanical engineer.



09 65 16 Resilient Sheet Flooring

2.3

Adhesives:

- .1 Shall be for heavy traffic and commercial jobs, have a strong high peel, strength, very low odour, soap and water clean up, and be environmentally safe with no hazardous ingredients and zero VOC.

2.4

Replacement materials

- .1 For projects under \$1,000,000.00, do not request to the general contractor the 2% of surplus replacement materials.

END OF SECTION 09 65 16



09 65 19 Resilient Tile Flooring

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying resilient tile flooring work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Specify vinyl tile flooring for all floors except mechanical rooms, washrooms, vestibules, executive and professional offices, and meeting rooms.
- .2 Specify that the contractor clean floors of construction debris, dirt, and grease as a requirement of substantial completion. The contractor must not wax new flooring: the University will clean, seal, and wax floors as necessary after acceptance.

Part 2 Products

2.1 Vinyl Composite Tile Flooring

- .1 Preferred tiles: shall be 305 x 305 mm with minimal recycled content of 20 %, "Premium visual tile", "Brushwork" or "Colorpoint" series, as manufactured by Mannington commercial, or approved equivalent.
- .2 For smaller budget projects: 305 x 305 mm x 3 mm thick tile, "Contract", "Fortress", or "Colour-Thru" series as manufactured by Amtico, or approved equivalent.

2.2 Base Board

- .1 Shall be rubber base, 100 mm high, or as per existing. Vinyl base materials are forbidden.

2.3 Adhesives

- .1 Shall be for heavy traffic and commercial jobs, have a strong high peel, strength, very low odour, soap and water clean up, and be environmentally safe with no hazardous ingredients and zero VOC.

2.4 Replacement materials

- .1 For projects under \$1,000,000.00, do not request to the general contractor the 2% of surplus replacement materials.



09 65 19 Resilient Tile Flooring

Part 3 Execution

3.1 Installation-General

- .1 Using a neutral cleaner and a rotating machine (polisher), remove the sealer that has been installed from the tile manufacturer.
- .2 Neutralize the tile flooring with a neutral cleaner using mop.
- .3 Apply three (3) to five (5) coats of wax (high gloss or high traffic depends on the level traffic in the area).

END OF SECTION 09 65 19



09 68 00

Carpet

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying carpet work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Specify carpet flooring for executive offices, professional offices, and meeting rooms and replacement of existing carpet.
- .2 Specify manufacturer with “carpet reclamation” program.
 - .1 When removing existing carpet, return to manufacturer with “carpet reclamation” program for recycling purposes.
 - .2 Carpet component destinations in “carpet reclamation program” should be as follow:
 - .1 Nylon 6 type fiber carpets shall be sent to a nylon recycling facility allowing “Cradle to cradle” recycling process.
 - .2 Nylon 6.6 fiber carpets shall be sent to a recycling facility allowing “waste-to-energy” recycling process.
 - .3 PVC backed carpets should be sent to recycling facility allowing “downcycling” process.
 - .3 When selecting carpet, consideration must be given to contrast and lightness of carpet design for maintenance purposes.
 - .4 Determine medium or heavy traffic use when specifying carpet.

1.3 Guarantee

- .1 All work described in this section shall be guaranteed for a period of ten (10) years from the date of substantial completion of the work.
- .2 Specify carpets certified for interior quality of air under the Carpet and Rug Institute and/or Canadian Carpet Institute.
- .3 Carpet shall be certified “Cradle to cradle” by a third party.



09 68 00

Carpet

Part 2

Products

2.1

Material Requirements

- .1 Carpet and carpet backing shall be zero (0) PVC and with minimal recycled content of 20%.
- .2 Carpet shall be nylon type 6, modular (tile carpet) for recycling purposes.
- .3 Use products from "Shaw Contract group" or approved equivalent.

2.2

Adhesives:

- .1 Shall be for heavy traffic and commercial jobs, zero (0) VOC, solvent free, low odour, contain no hazardous chemicals, meet CRI Green label and be releasable/rebondable for carpet tiles.
- .2 Shall be approved by the carpet manufacturer.
- .3 Acceptable products: "Shaw 5000" as manufactured by Shaw Contract group, or approved equivalent.

2.3

Replacement materials

- .1 For projects under \$1,000,000.00, do not request to the general contractor the 2% of surplus replacement materials.

2.4

Baseboards

- .1 Shall be solid color broadloom carpet, 102 mm and same as carpet tile manufacturer.

Part 3

Execution

3.1

Removal of existing carpet and cut-outs of new installed carpet

- .1 All taken-out-of-site carpet shall be directed to a recycling manufacturer. Recycling documentation and recycling usage must be sent to Project Manager by manufacturer with "carpet reclamation" program upon project completion as proof.

END OF SECTION 09 68 00



09 84 10 Acoustic Treatment

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying acoustic treatment work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Partitions around classroom shall extend to the underside of slab and be insulated for sound; min STC 52.
- .2 Partitions around washrooms shall extend to the underside of slab and be insulated for sound; min STC 47. If washroom is next to an office or a classroom, partitions shall be STC 52.
- .3 Partitions around executive offices and conference room shall extend to the underside of slab and be insulated for sound; min STC 52.
- .4 Partitions around other offices shall extend to the underside of suspended coating.

Part 2 Products

2.1 Wall Acoustical panels

- .1 Shall be high impact resistant as manufactured by Decoustics or approved equivalent.

END OF SECTION 09 84 10



09 91 26 Painting

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying re-painting. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

- .2 This Section includes surface preparation and field painting of the following:
 - .1 Exposed interior and exterior items and surfaces.
 - .2 Surface preparation, priming, and finish coats.

1.2 Design Requirements

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable.
- .2 Paint materials for paint systems shall be products of a same manufacturer.
- .3 All paintings shall be zero (0) VOC, except for dark color painting and exterior painting that shall be low VOC (max 50g/L).
- .4 Painting colorant shall contain no glycol and no other toxicity.
- .5 All surface finishes for walls, doors and frames shall be 20% to 30% gloss for maintenance purposes.
- .6 Recycle content painting is preferred if color wanted is available in that type of product.
- .7 All sealers shall be in accordance with CAN/ONGC-1GP-119 2000 and approved by finish product manufacturer.
- .8 Apply coatings at manufacturer's recommended spreading rate to achieve indicated dry film thicknesses.
- .9 Before applying finish product on wood surfaces, test product by first applying on small area of surface to verify compatibility between product and surface.

Part 2 Products

2.1 General painting:

- 1. Material Compatibility: Specify block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.



09 91 26

Painting

- 2. Acceptable products: "Ecosource" as manufactured by SICO, "Ecospec" and "Aura", as manufactured by Benjamin Moore, "Harmony" as manufactured by Sherman Williams and series manufactured by Boomerang.

2.2

Specific painting

- 1. Animal Facilities: New Walls
 - .1 Sealer: acceptable products: "#870-177" as manufactured by SICO, or approved equivalent. "K253" latex sealling primer or "Eco Spec WB K372" interior latex primer as manufactured by Benjmain Moore, or approved equivalents.
 - .2 Two (2) coats, epoxy 2 comp: acceptable products: "Sierra S50/ water base epoxy 2 comp" as manufactured by SICO, "Duroplast 150" as manufactured by Duochem, "KP 43" epoxy gloss coating as manufactured by Benjamin Moore or approved equivalent.
- 2. Animal Facilities: Existing Walls
 - .1 Two (2) coats, epoxy 2 comp: acceptable products: "Sierra S50/ water base epoxy 2 comp" as manufactured by SICO, "Duroplast 150" as manufactured by Duochem, "KP 43" epoxy gloss coating as manufactured by Benjamin Moore or approved equivalent.
- 3. Floors
 - .1 Interior walkway concrete floors: acceptable products: "Duroplast 100" as manufactured by Duochem, or approved equivalent.
 - .2 Animal Facilities "Lave-cage" Rooms: Floors: acceptable products: "Ureclad 44" as manufactured by Duochem, or approved equivalent.
 - .3 Animal Facilities: Floors: acceptable products: "Sierra S40 Rust-Oleum44" as manufactured by SICO, "Duochem 7105" as manufactured by Duochem or approved equivalent.
 - .4 Mechanical Rooms Floors
 - .1 For mechanical room without storage, acceptable products: "Duochem 390 membrane (35 mils)", with "Duochem 6001 finish" as manufactured by Duochem, or approved equivalents.
 - .2 For mechanical room with storage, acceptable products: "Duochem 390 membrane", with "Duochem 391 primer", and "Duochem 6001 finish" as manufactured by Duochem, or approved equivalents.
 - .5 Concrete slab on grade: acceptable products: "Duochem 8200" as manufactured by Duochem, or approved equivalent. Choose another product if chemical resistance is needed.
 - .6 Wood floors
 - .1 Historical building, old wood flooring:



09 91 26

Painting

- .1 If reparations have to be done with new planks, use a colorant stain on all surfaces before varnishing for a final uniformity.
- .2 Loose floor boards have to be replace by new planks.
- .3 Filler product are to be avoid.
- .2 Sanding
 - .1 Dustless sanding machine has to be use.
 - .2 Light weight machine has to be use (-200lb).
 - .3 Hand scraping has to be done on perimeters.
- .3 Varnish
 - .1 Verify with manufacturer compatibility of the product with the existing wood specie and finish before specifying.
 - .2 Shall be low VOC (max 200g/L).
 - .3 Test durability to meet: ASTM D4060.
 - .4 Sealer: Acceptable product: "Schwartz 81C1" sealing agent, apply two (2) coats, as manufactured by Schwartz Chemicals Corporation, or approved equivalent.
 - .5 two (2) coats: "Rebound" water based finish product as manufactured by Schwartz Chemicals Corporation, or approved equivalent.
- .7 Level floors with cove bases (For Heavy-Duty Waterproof Areas):
 - .1 Prepare all new and existing concrete surfaces with abrasive blasting equipment (Blastrac).
 - .2 Grind surface imperfections to obtain a smooth and level surface.
 - .3 Apply (1) coat: acceptable products: "Rust-oleum prime and seal primer penetrating (5-8 mils)" as manufactured by SICO, "Duochem 576 primer penetrating" as manufactured by Duochem, or approved equivalent. .
 - .4 Apply (1) coat: acceptable products: "Rust-oleum overkrete HD", 6 mm (1/4") non-porous mortar with 100 mm (4") high "Rust-oleum overkrete cove base mortar" as manufactured by SICO, "Duochem 9400 with "Duochem 5235" as manufactured by Duochem, or approved equivalent.
 - .5 Apply two (2) coats: 15 mils dry film thickness per coat for smooth finish: acceptable products: "Rust-oleum overkrete xtra E-100S" as manufactured by SICO, "Duochem 7105" as manufactured by Duochem, or approved equivalent.
 - or
 - .6 Apply one (1) coat: 25 mils dry film thickness per coat for semi-smooth finish: acceptable products: "Rust-oleum overkrete xtra E-100S" as manufactured by SICO, "Duochem 7105" as manufactured by Duochem, or approved equivalent.
 - or



09 91 26

Painting

- .7 Apply one (1) coat: 20 mils dry film thickness per coat for non-skid finish: acceptable products: "Rust-oleum overkrete xtra E-100S" as manufactured by SICO, "Duochem 7105" as manufactured by Duochem, or approved equivalent.
- .8 Sloped floors with cove bases (for Heavy-Duty waterproof Areas):
 - .1 Prepare all new and existing concrete surfaces with abrasive blasting equipment (Blastrac).
 - .2 Grind surface imperfections to obtain a smooth and level surface.
 - .3 Apply one (1) coat: acceptable products: "Rust-oleum prime and seal primer penetrating (5-8 mils)" as manufactured by SICO, "Duochem 576" as manufactured by Duochem, or approved equivalent.
 - .4 Before the primer has cured, apply grout to form a sloped floor to drain, 3 mm per 305 mm (1/8" per ft.) slope, with a minimal thickness of 3 mm (1/8"):
 - .1 Acceptable products: "Rust-oleum overdrive epoxy grout" as manufactured by SICO, "Duochem 9400" as manufactured by Duochem, or approved equivalent.
 - .5 Once the epoxy grout has set, apply "Rust-oleum overkrete HD 6 mm (1/4") non-porous mortar with 100 mm (4") high "Rust-oleum overkrete cove base mortar", "Duochem 9400" with "Duochem 5235" as manufactured by Duochem, or approved equivalent.
 - .6 Apply two (2) coats: 15 mils dry film thickness per coat for smooth finish: acceptable products: "Rust-oleum overkrete E-100S" as manufactured by SICO, "Duochem 7105" as manufactured by Duochem, or approved equivalent.
- .9 Washrooms typical floors
 - .1 Two (2) to tree (3) coats: acceptable products: "Sierra S40 concrete epoxy enamel" as manufactured by SICO, "Duroplast 150" as manufactured by Duochem, or approved equivalent.
- .10 Washrooms: Floors and cove bases (For Heavy-Duty Waterproof areas):
 - .1 Apply one (1) coat: approved products: "Rust-oleum prime and seal primer penetrating (5-8mils)" as manufactured by SICO, "Duochem 576" as manufactured by Duochem, or approved equivalent.
 - .2 Apply two (2) coats: 15 mils dry film thickness per coat for smooth finish.
 - .1 Acceptable products: "Rust-oleum overkrete xtra E-100S" epoxy coating as manufactured by SICO, or "Duochem 7105" as manufactured by Duochem, or approved equivalent.
- 4. Doors and Frames
 - .1 Wood door and frame
 - .1 One (1) coat primer: acceptable product: "Sierra Griptec" as manufactured by SICO, "No 4000" no odor alkyde sealling primer or



09 91 26

Painting

- .5 Paint all exposed pipes. Mechanical and electrical equipment, panels, and the like, shall remain in factory-applied finishes.
- 2. Typical Floors:
 - .1 Scrape loose paint and repair surfaces with materials compatible with surface composition then sand and clean surfaces.
 - .2 Ensure that all surfaces are dry, clean, free from dust, grease, wax, soap, rust, mildew, tool and machine marks, insects, etc., by washing with Trisodium Phosphate.
 - .3 Application as per manufacturer's specification.
- 3. Walls, ceilings, doors, frames, wood surfaces, etc.:
 - .1 Scrape loose paint and repair surfaces with materials compatible with surface composition then sand and clean surfaces.
 - .2 Ensure that all surfaces are dry, clean, free from dust, grease, wax, soap, rust, mildew, tool and machine marks, insects, etc., by washing with Trisodium Phosphate.

END OF SECTION 09 91 26



10 11 00 Visual Display Boards

Part 1 General

1.1 Summary

1. In general, follow the standards below when specifying chalkboard work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

1. Each classroom shall be equipped with black (not colored) Lauzonite chalkboard. A white chalk less board may be used in certain instances. In some cases, both may be desirable.

Part 2 Products

2.1 Chalkboards

1. Shall be black, Lauzonite boards, Series 900, Ready Frames Units with vertical sliding panels. Boards shall be 13mm thick and come with aluminium side trim, map rail, chalk rail and chalk rail end cap as manufactured by the "Canadian Blackboard Co. Ltd." or approved equivalent.

2.2 Whiteboards

1. Shall be Pearl White, Lauzonite boards, Series 900, Ready Frames Units. Boards shall be 13mm thick and come with aluminium side trim, map rail, chalk rail and chalk rail end cap as manufactured by the "Canadian Blackboard Co. Ltd." or approved equivalent.

2.3 Tack boards

1. Shall be Coloured Cork boards, Series 2000, Ready Frames Units. Boards shall be 6mm thick onto 6mm Fibreboard as manufactured by the "Canadian Blackboard Co. Ltd." or approved equivalent.

2.4 Self-adhesive white boards

1. Shall be writable and projectable surface, "Versa Pro" as manufactured by "Egan", or approved equivalent.



McGill

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DIVISION 10- SPECIALITIES

10 11 00 Visual Display Boards

END OF SECTION 10 11 00



10 14 24 Building Panel Signage

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying signage and accessories. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Interior Signage: New signage to comply with the "Interior Signage Standard", revised on October 2007, issued by the "Planning and Institutional Analysis Office" at <http://www.mcgill.ca/pia/signage/interior>.

For renovation projects, consult the Project Manager for information regarding existing room signs and extend. Usually where one or a few new signs are to be installed the new signs should match the existing signs. However in area where only a few signs are to be installed, designers should evaluate the feasibility of replacing old non-compliant signs with new ones in the visibility contiguous area.

- .2 Exterior Signage: Consult the Project Manager who will coordinate with the University "Planning and Institutional Analysis Office: for information regarding permanent signs on buildings.

- .3 Room Number Assignments: Refer to the "Room Number Guidelines: revised on May 1, 2006 and issued by the Planning and Institutional Office, at <http://www.mcgill.ca/pia/plans/autocadstandardsandguidelines/>

1.3 Guarantee

- .1 All work described in this section shall be guaranteed for a period of five (5) years from the date of substantial completion of the work.

Part 2 Products

2.1 Identification / Direction Signs

- .1 Shall be generally white engraving on black painted aluminium panel, as per "Insignia" system as manufactured by "Saic, Signalisation architecturale".



10 14 24 Building Panel Signage

2.2 Information Signs

- .1 Shall be generally white engraving on appropriate color, plexiglass panel, as per "E-Oply" system as manufactured by "Saic, Signalisation architecturale".

Part 3 Execution

- .1 Follow manufacturer's specifications.

END OF SECTION 10 14 24



10 21 20

Solid Plastic Toilet Partitions

Part 1 General

1.1 Summary

1. In general, follow the standards below when specifying solid plastic toilet partitions work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirement

1. The partitions shall be vandal resistant, graffiti resistant, scratch resistant and impact resistant except otherwise specified by the Project Manager.

1.3 Guarantee

1. All work described in this section shall be guaranteed for a period of fifteen (15) years from the date of substantial completion of the work.

Part 2 Products

2.1 All partitions

1. Shall be phenolic, series 1090/1190 by Decolam, or series Siera 1090, Solid Core Reinforced Composite same color throughout, as manufactured by Bobrick or approved equivalent.
2. For ceiling mounted partitions, use series 1090/1190 solid phenolic as manufactured by Decolam, or approved equivalent.

2.2 Urinal Partitions

1. Shall be flange mounted screen, unless noted otherwise.

2.3 Hardware

1. 1.1 All hardware is to be 18-8 type 304, stainless steel with satin finish.

END OF SECTION 10 21 20



10 28 10 Toilet and Bath Accessories

Part 1 General

1.1 Summary

1. In general, follow the standards below when specifying toilet and bath accessories. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

1. One mirror shall be supplied and installed above each washbasin in all washrooms.
2. One inclined handicap mirror shall be supplied and installed above each designed handicap washbasin.

1.3 Guarantee

1. The mirrors described in this section shall be guaranteed for a period of fifteen (15) years from the date of substantial completion of the work.
2. The hand dryers described in this section shall be guaranteed for a period of five (5) years from the date of substantial completion of the work.

Part 2 Products

2.1 Toilet Paper Holders

1. Shall be "Jumbomatic Tissue Systems" model no.P-11 (412121), one 26cm diameter roll, design for both medium to heavy traffic as manufactured by Wyant, or approved equivalent.

2.2 Liquid Soap Dispensers

1. Shall be model #707, white, plastic, as manufactured by Frost Ltd or approved equivalent.
2. Two (2) units shall be supplied and installed above and between each washbasin in all washrooms.

2.3 Sanitary Napkin Disposal Units

1. Shall be model #620, steel, white epoxy, as manufactured by Frost Ltd, as supplied by Wyant, or approved equivalent.



10 28 10 Toilet and Bath Accessories

2. One (1) unit shall be supplied and installed in each toilet stall in all women's washrooms.

2.4 Garbage Disposal Containers

1. Bottom units shall be model #05335690001, plastic, beige, as manufactured by Rubbermaid, or approved equivalent.
2. Top units shall be model #05335240004, plastic, brown, as manufactured by Rubbermaid, or approved equivalent.
3. One (1) complete unit shall be supplied and installed in all washrooms.

2.5 Washroom Mirrors

1. Shall be 6mm polished plate glass, mirror quality.
2. Mirrors shall be 610mm wide by 760mm high, unless noted otherwise, with 24-gauge one-piece stainless steel frames with metered corners and vandal proof concealed fasteners.
3. One (1) complete unit shall be supplied and installed above each washbasin in all washrooms.
4. One inclined handicap mirror shall be supplied and installed above each designed handicap washbasin.

2.6 Air freshener

1. Shall be Model 1107, metered aerosol system, as manufactured by Frost Ltd, with command performance, programmable fragrance spray intervals, or approved equivalent.

2.7 Hand dryers

1. Sample hand dryers currently being tested. Results to come.
2. For areas where noise isn't a design constraint, install Model XL-W, as manufactured by "XLERATOR", or the "Airblade" as manufactured by Dyson or approved equivalent.
3. For areas where noise is a design constraint, such as washrooms near classrooms, libraries, or other noise sensitive areas, specify a < 55 db silent hand dryer model.

2.8 Grab bars

1. Shall be 32 mm diameter, stainless steel, as manufactured by Bobrick B-5806, or approved equivalent.



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DIVISION 10- SPECIALTIES

10 28 10 Toilet and Bath Accessories

END OF SECTION 10 28 10



12 35 54 Laboratory Casework

Part 1 General

1.1 Summary

- 1.1 In general, follow the standards below when specifying metal laboratory work and storage cabinets. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.
- 1.2 Consult with the Project Manager for general layout and specific casework requirements.

1.2 Design Requirements

- 1.1 Casework:
 - .1 Specify metal casework when lab requesting complete new caseworks.
 - .2 Specify wood casework to complete or modify existing wood casework lab. Seal wood casework to prevent absorption of spilled materials
 - .3 Stainless steel casework is highly recommended for animal facilities. Wood casework are not permitted in animal facilities.
- 1.2. Storage Cabinets:

See Laboratory design Standards, <http://www.mcgill.ca/ehs/laboratory/design/>.

Part 2 Products

- 1.1 Cabinets
 - .1 Suspended drawers and cabinet element are preferred.
- 1.2 Hardware
 - .1 In newer buildings, and as otherwise possible, match existing handles and hinge styles. Usually specify manufacturers' standard units.
- 1.3 Finish
 - .1 Manufacturer's standard finish is acceptable. Unless otherwise directed by the Project Manager.
- 1.4 Countertops: The following materials are listed as guidance for selection:
 - .1 Plastic laminate: Shall be made of 32mm plywood and covered with "Arborite Flex 4" or approved equivalent. The nosing shall be 19mm solid plastic with drip groove.



12 35 54 Laboratory Casework

- .2 Stainless steel: gage 18, type 318 or 304 on 32mm particle board.
- .3 Epoxy resin: Usually specified 25mm thickness.
- 1.5 Shelves:
 - .1 Specify brackets spaced not more than 915mm on centre to prevent shelves sagging.
- 1.6 Storage cabinets:
 - .1 Generally speaking, ventilation of the Storage cabinets is not required. The original cap should be kept in place or the ventilation openings shall be sealed with materials providing a fire protection at least equivalent to that required for the construction of the cabinet.
 - .2 If ventilation is requested, the cabinet shall be vented outdoors using vent piping providing a fire protection at least equivalent to that required for the seals above mentioned. Exhaust to the building ventilation system is not permitted.
 - .3 The cabinets for flammable and combustible liquids shall not be stored in or adjacent to exits or principal routes that provide access to exits, as specified in the National Fire Code section 4.2.2.

END OF SECTION 12 35 54



12 48 20 Foot grilles

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying resilient tile flooring work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- .1 Specify foot grille for each entrance of a building. The grille must cover the total width of the door's minimum and the length of the vestibule.
- .2 The installation of the drain shall be discussed with the Design Manager prior to the designing of the installation of the foot grille.
- .3 When installing a drain, allow easy access for cleaning and maintenance.

Part 2 Products

2.1 Foot Grille

- .1 Shall be anti-slippery as model BSA-1-3 as manufactured by Bolar or approved equivalent. The grille shall be aluminum 6061-T6, natural finish, argon welded. The grille shall resist to a minimal load of 520 kg/m². Invisible supports shall be specified every 150mm in both directions. Use BSA 1-3-HL (high load) if one is not sure on the expected loads.
- .2 For excessive load for vehicles, lift-trucks, etc., the grilles shall be as model "BA-1-3-HL" as manufactured by Bolar or approved equivalent.
- .3 Each lay-in traffic trend should exceed 23kg and shall be provided with lifting bracket.

2.2 Frame

- .1 Shall be "Z" shaped with anti-noise cushion.
- .2 Shall be "W" shaped aluminum frame with continuous anchors.

2.3 Pan

- .1 Shall be stainless steel, gauge 22 with welded joints.
- .2 When a drain shall be installed, the pan shall be stainless steel, gage 14 with welded joints
- .3 Size and depth is to be coordinated on site.

2.4 Drain

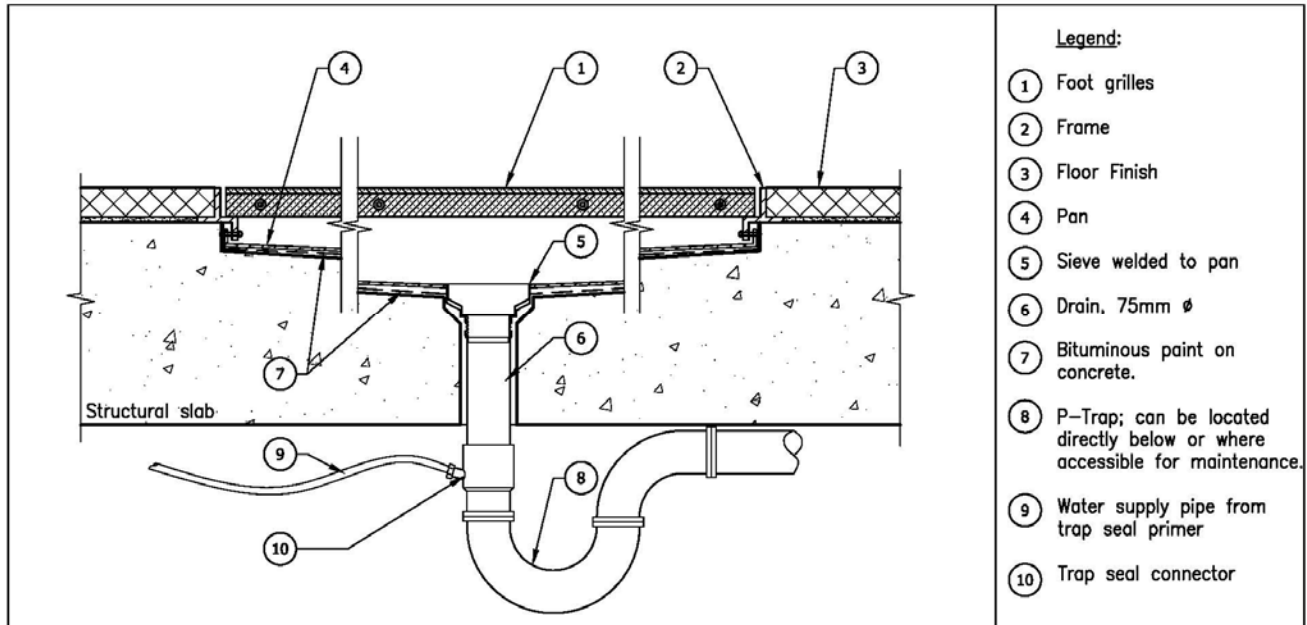
- 1. Drains shall be stainless steel.
-
-

12 48 20

Foot grilles

Specify the installation for a 75mm stainless steel sieve, as model "Snap-On" as manufactured by BMI, shall be installed at the bottom of pan. Drain shall be 75mm in diameter, stainless steel and shall be welded to bottom of pan. The length of the drainage pipe shall be coordinated on site: minimum 100mm depth shall pass below the bottom of the concrete slab so as to allow junction with a mechanical joint.

2. Shall install a P-Trap and shall be located so as to be accessible for maintenance.
3. Shall have trap seal primer
4. Connect a water supply drain to trap seal so as to allow for a continuous flow through the drain.
5. Two (2) coats of bituminous paint on concrete slabs under pan and pipe opening are required.



Part 3 Execution

3.1 General

- .1 All sides of the pan that are in contact with a concrete surface must be covered with two (2) layers of bituminous paint.
- .2 The installation of the foot grille in a sand coat is forbidden. Specify levelled concrete.



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DIVISION 12- FURNISHING

12 48 20

Foot grilles

END OF SECTION 09 65 19

12 51 30 Window covering

Part 1 General**1.1 Summary**

1. In general, follow the standards below when specifying blinds. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

1. General – A University-wide standard for window coverings does not exist. Window covering is determined for each building individually, and is based on exterior and interior appearance, environment, existing window coverings in adjacent areas, use and maintenance considerations.
2. Aesthetics – The base standards for new buildings on both exterior and interior appearance. When designing remodelling projects within an existing building, consider using the same type of window coverings as existing adjacent areas.
3. Environment – Consider requirements for protecting areas from the glare and heat of the sun. Also consider the environmental conditions in which the coverings will perform, such as exposure to chemicals, humidity, dirt or grease. Review flame retarding properties of window coverings for compliance with codes and condition of use.
4. Use – Public and student occupied areas need to withstand significant abuse. Venetian blinds specified for these areas need heavy ladder, top slat and of bottom rail construction, good quality of slat materials, and operating mechanisms that eliminate overdrive (preventing damage to worm gear or control wand). Private offices may use blinds fabricated of lighter weight material and without overdrive protection. Consult Project Coordinator.
5. Installation – The University requires that a qualified dealer purchase and install blinds or shades composed of parts from the same manufacturer (single-source responsibility for both supplier and manufacturer) and labelled as to manufacturer and brand name. This is to assist in repair or replacement either by a qualified dealer or by Building Services.

1.3 Guarantee

1. All work under this section shall be guaranteed for a period of five (5) years from the date of substantial performance of the work.

DIVISION 12- FURNISHINGS

12 51 30 Window covering

Part 2 Products**2.1 Horizontal Blinds**

1. Shall be 25mm wide, aluminium with baked enamel finish as "Precious Metal" by Hunter Douglas or approved equivalent.

2.2 Chain roller shade

1. Adjustment-free system shall be comprised of multi-banded steel springs that create the pressure necessary to keep the shade in the desired position. All plastic components to be made of glass reinforced polyester thermopolymer (PBT) conforming to military specification MIL M-24519. System is to be symmetrical for left or right hand installation. Controlled by plastic bead chain on polyester cord (50-lb. test). Brackets are to be constructed of 1,8 mm thick painted or nickel-plated, C1008/1010 cold rolled steel. Painted brackets are finished with high quality baked enamel coating. End plug bracket shall have a lock down retainer device. Brackets are reversible for right or left-hand installation. Extruded aluminium tube, alloy 6063-T5, of a diameter required to support shade fabric without excessive deflection. No adhesive tape or rivet will be accepted to attach the shade. A fabric attachment spline will be slid in the tube groove, preventing shade detachment. A portion of the tube under the groove shall be reinforced allowing for flush insertion of the spline, such as Altex's ALS system or approved equivalent. Screen fabric, False leno, 100% glass fabric with PVC free and halogen free coating, thickness of 0,18 mm (0,007 inches), % openness factor to be specified, M1 and NFPA certified for flame retardant, bacteria and fungal resistance as of "Altex Texscreen Nature" or approved equivalent.

2.3 Black Out:

1. Frame shall be spring assisted chain, extruded aluminum alloy 6063-T5, hem bar of ergonomic design, 13 mm deep x 51 mm high, slides inside the channels, weighted appropriately for shade to hang flat, attached to the fabric by a plastic spline, such as Altex's AV3 bottom bar or approved equivalent. Side channels extruded aluminum alloy/hardness 6063-T5, anodized, 70 mm width x 25 mm deep or 89 mm width x 25 mm deep. Bristles enhance system opacity. As Altex Avantek side channels or approved equivalent. Opaque fabric, 4-Ply laminated fibreglass (3 plys PVC, 1 ply fibreglass), thickness of 0,30 mm (0,012 inches) depending on the colour, 100% opaque, NFPA certified, of Altex 6000 or approved equivalent. **Special attention on south and west orientations: make sure there is enough ventilation between the glazing and the blind (at high temperature, the glass can break)**

END OF SECTION 12 51 30

14 21 23 Elevators

Part 1 General**1.1 Summary**

- .1 In general, follow the standards below when specifying conveying equipment modifications or installations. All modifications to conveying equipment must be authorised by McGill University and not by a general contractor. Contract work on conveying equipment must remain independent from other work contracts.

Part 2 Products**2.1 Materials**

- .1 If one or more of the following materials are replaced, it is mandatory to provide and install the new material as specified below:
- .1 Controller: "MCE" with the necessary hardware to connect the controller to the elevator's alarm system (Imonitor + Ireport).
 - .2 Controller: "MCE" with the necessary hardware to connect the controller to the elevator's alarm system (Imonitor + Ireport).
 - .3 Door Operator: "GAL"
 - .4 Push Buttons: "Inox" DUPAR/US918BB with Braille inscriptions.
 - .5 Open/Close Door Device: Infrared beam system from "MEMCO" with 2D beams.
 - .6 Emergency System: "Hollister-Whitney" brand
- .2 Trade-marks should not be perceptible to the user.
- .3 Car operator panels should include the cabin number and maximum weight. The Open/Close button must be next to the main level button. The operator panel must also comply with the Quebec Construction Code and code B44-04 annex E (Barrier Free Design).
- .4 Hall/Lobby operator panel must be positioned so that the push buttons are 1070 mm from the floor at each level. The operator panel must also comply with the Quebec Construction Code and code B44-04 annex E (Barrier Free Design).
- .5 The contractor must ensure the identification of each level with two stainless steel plaques that include visual and Braille characters in brushed finish #4 on a black background. The number must a minimum of 50 mm (2 inches) high and engraved characters must be a minimum of 75 mm (3 inches) high. These standards may be adjusted to coordinate with the building design.

14 21 23 Elevators

- .6 All signage or inscriptions must use international symbols, and information must be present in both French and English.
- .7 The mechanical room door must be equipped with an A4H lock.
- .8 Keys used for fire systems, and other independent systems, in the elevator cars, floor lobbies or alarm fixtures must be 4001 keys.

2.2 Finishes

- .1 Interior finishes can be specified to meet the needs of the building director.
- .2 Floor finish must be non-slip and fire rated.

2.3 Handrails

- .1 Typical handrail: 1/4" x 2" Stainless Steel Handrail (brushed finish SS#4) or stainless steel tube with 1½" diameter, on all non access walls. Installed at height of 813mm.

2.4 Baseboard

- .1 To avoid damage from wheelchairs, baseboards shall be 305mm high stainless steel, unless noted otherwise by building director.

2.5 Protective elevator pads

- .1 Install hooks or knobs at top of walls (inside of cab) in order to install protective elevator pads.

2.6 Lighting

- .1 Provide adequate, glare-free lighting in the elevator cab, with a minimum lux of 200 to the ground.

2.7 HVAC

- .1 Shall be natural and mechanized ventilation from a dual speed fan, for continuous long-term operation.

END OF SECTION 14 21 23



21 13 10

Portable fire extinguishers and fire hoses

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when renovating a room or suite of rooms or for new constructions. All requirements outlined herein shall be reviewed with the McGill University Fire Prevention Office (FPO) and confirmed before the commencement of construction

1.2 Design Requirement

- .1 Clearly indicate items or equipments to be relocated. Indicate their actual and future location.
- .2 Indicate to protect existing items designated to remain and items designates for salvage.
- .3 Provisions shall be made for the adequate and long term support of the unit on the wall: an extinguisher cabinet or the manufacturers hook attached to a solid wood board and attached to a structural member of the wall
- .4 Height of extinguisher mounted on the wall: top of the unit at a maximum 3.5 feet and bottom at a minimum 4 inches from the ground.
- .5 Type of extinguisher to be installed:
 - .1 Dry chemical portable fire extinguisher of classification 2A10BC (minimum), ULC listed, will be installed in main corridors of campus buildings and in residential buildings.
 - .2 Water mist portable fire extinguishers of classification 2A;C (minimum), ULC listed, will be installed in libraries, computer laboratories and office suites.
 - .3 FPO`s must be consulted to determine the classification requirements for extinguishers to be installed in laboratories and service spaces.
 - .4 Class K portable fire extinguishers, ULC listed, should be installed in commercial kitchens.
- .6 Standpipe and hoses shall be maintained unless otherwise determined by the FPO.
- .7 Devices are required for the supervision of water flow and control valves of a standpipe and hose system. These devices shall be distinctly connected to the fire alarm system for supervision to the Central Monitoring Station.



21 13 10

Portable fire extinguishers and fire hoses

1.3

Restrictions

- .1 The Project Manager for the FPO will recuperate existing units designed to be replaced.
- .2 The existing portable fire extinguishers are not to be used for the protection of the construction site. The contractors must provide their own portable fire extinguishers during construction.
- .3 The hose stations and cabinets in the building area under renovations must be maintained. The hoses are not to be used for purposes other than extinguishing a fire.

1.4

Signage

- .1 The posting of proper McGill safety sign shall indicate the location of each portable extinguisher. "McGill University Interior Signage Standards" must be used.
- .2 The posting of the proper McGill safety sign shall indicate the location of each fire hose cabinet. "McGill University Interior Signage Standards" must be used.

1.5

Required Documentation

- .1 The installing contractor shall provide all literature and instruction manuals provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed.

END OF SECTION 21 13 10



21 13 13 Wet Pipes Sprinkler Protection

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying sprinkler protection modifications or installations. All requirements outlined herein shall be reviewed with the McGill University Fire Prevention Office (FPO) and confirmed before commencing any sprinkler system design, installation or modification.

1.2 Design Requirements

- .1 Clearly indicate items or equipment to be relocated. Indicate their actual and future location.
- .2 Indicate to protect existing items designated to remain and items designated for salvage

1.3 Signage

- .1 A dated placard with design details of the sprinkler system and areas of coverage shall be posted at the main valve of the system. (Details in chapter 10-5 of NFPA #13)
- .2 Signage identifying the location of any section valves in a ceiling space or other concealed space shall be provided so that the valves can be found quickly in an emergency.
- .3 Signs indicating the location of the main water valve shall be posted in the building. The signs shall permit the Fire Department to find the valve quickly from the location of the fire alarm panel.
- .4 Section valves must be provided with signage indicating the coverage area of this part of the system

1.4 Required Documentation

- .1 As-built drawings of the sprinkler system modifications/installations shall be provided to the FPO.
- .2 Copies of the Hydraulic calculations and the contractors detailed sprinkler plans must be provided to the FPO and to McGill Risk Management for the insurers.
- .3 As part of the system acceptance, original copies of the Contractor' s Material and Test Certificates for above ground piping and below ground mains must be provided to the FPO. (Samples in NFPA # 13 Chapter 10.)
- .4 A hard copy and an electronic version of a list of all fire alarm points related to the supervision of the sprinkler system will be submitted to the FPO.



21 13 13 Wet Pipes Sprinkler Protection

- .5 The installing contractor shall provide all literature and instruction manuals provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed.

1.5 Restriction

- .1 Work on existing systems must be coordinated with McGill Facilities Supervisors and the Project Manager.
- .2 Specify the period of the day for work, to avoid noise in the building.
- .3 Flow tests must be conducted with fire alarm horns/bells deactivated to avoid noise in the building.
- .4 In coordination with the Project Manager, specify the path to evacuate garbage. All materials that are recyclable should be pointed out to the Project Manager for recycling through either Building Services or the Waste Management Program.
- .5 Mercury switches that are removed from sprinkler systems should be treated as hazardous waste and put aside for the Waste Management Program.

Part 2 Products

2.1 Materials

- .1 Sprinkler system control valves should be OS&Y or butterfly type valves. Non gear operated valves are refused unless used on small lines (less than 1 in).
- .2 All sprinkler system control valves should be quickly accessible. If they need to be in concealed spaces an access panel must be quickly removable.
- .3 All sprinkler system components must be ULC listed for use on a sprinkler system.
- .4 Devices are required for the supervision of water flow, hi/low water or air pressure in the system and control valves. All of these devices shall be separately connected to the fire alarm system for supervision to the Central Monitoring Station. If a fire pump is installed, power off to the pump and pump running must be supervised.
- .5 All spaces in a sprinklered building must be protected. Provisions must be made for the protection of: offices with new false ceilings, beneath new mezzanines, beneath large ventilation ducts, modified office spaces with new partitions, etc.



21 13 13 Wet Pipes Sprinkler Protection

Part 3 System Acceptance

3.1 System Operational tests

- .1 Water flow tests using the inspector's test pipe shall be conducted in the presence of an FPO and of a representative of Facilities Operations. A 2 in. drain test shall be done as well and the results are to be recorded on the contractors test certificate.

- .2 A hydrostatic test shall be done on renovated or new installations. If the project involves the modifications of 20 or fewer sprinkler heads, the testing pressure is not required to exceed the systems working pressure. Results are to be entered on the contractor's material and test certificate.

END OF SECTION 21 13 13



DIVISION 22- PLUMBING

22 00 00

Plumbing

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying plumbing work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment

1.2 Geometry and Locations

- .1 Service piping to be run wherever practical in ceiling spaces and in corridors. Avoid crossing rooms and user occupied spaces.
- .2 Piping must be accessible and serviceable, avoid installation behind large duct banks. Avoid vertically stacked installations when access is from below.
- .3 Valves, control points, joint couplings must be accessible for service and replacement.
- .4 Provide and install valves on systems where future extension or branching is possible or likely.
- .5 Remove all unused piping to the nearest branch line and cap.
- .6 Specify seismic gas shut-off valves for all new projects.
- .7 Provide and install shut-off valves on all services (G, A, V, HW, CW, etc.) at critical locations as identified by sector supervisor.

1.3 Identification

- .1 All piping systems to be identified with BRADY B-500 type stick on labels indicating system type and direction of flow.

1.4 Copper Piping

- .1 When used for drainage, hot and cold water supply, compressed air or other applications – Type M piping is FORBIDDEN. All copper piping should be a minimum thickness of TYPE L. For services over 100 psi, or for buried lines, use TYPE K.
- .2 Drainage for Steam Equipment is to be copper type L/silver solder.

1.5 Solder for Copper Piping

- .1 Solder should be silfos 95/5 for 100 psi or more.



DIVISION 22- PLUMBING

22 00 00

Plumbing

- .2 Under 100 psi 50/50 solder

1.6 Laboratory Drainage

- .1 Preferred material for lab drainage is polypropylene of the ORION type for all locations.
- .2 No mechanical joints allowed in polypropylene drain. All joints are to be with fused joints sealed.
- .3 Where existing installations used PYREX drains, the PYREX should be retained in renovations to avoid mixing the two materials.

1.7 New or Renovated Laboratories

- .1 Each point of supply into a laboratory of natural gas, liquefied petroleum gasses of compressed gasses shall be provided with labels identifying the gas.
- .2 Each workstation valves of natural gas, liquefied petroleum gasses or compressed gasses shall be colour coded for the identification of the gas.
- .3 Each point of supply into a laboratory of natural gas, liquefied petroleum gasses or compressed gasses shall be provided with an indicating, manual shut off valve. For inflammable or corrosive gasses, it is to be located in a safety cabinet with a transparent door (breakable for emergencies).
- .4 In new constructions and if possible, with renovations, the laboratory main control valve for these gasses will be located in the corridor near the entrance to the lab.
- .5 Adequate provisions for the storage of compressed gasses must be made with the following restrictions. The cylinders may never be located
 - .1 in any exits or corridor providing access to exits
 - .2 under any fire escape, outside exit stair, passage or ramp, or
 - .3 within 1 (one) meter of any exit.

1.8 Distilled Water and De-ionized Water Systems

- .1 Polypropylene piping to be used and fuse sealed.
- .2 Distilled water generators to be steam or electric type. Reverse Osmosis to be avoided.
- .3 De-ionized water generators shall be Reverse Osmosis as required.



DIVISION 22- PLUMBING

22 00 00

Plumbing

- .1 N.B. Designers to verify whether de-ionized water is really needed or whether distilled water will suffice.

1.9 Steam and Condensate Piping

- .1 Steam piping to be Schedule 40, welded for 2 ½ and over.
- .2 Condensate piping to be Schedule 80, welded for 2 ½ and over.

1.10 Drains for Ventilation and Air Conditioning Units

- .1 Drain all ventilation and air conditioning units via indirect funnel drains with slopes = 1/8" per 10 ft.

1.11 Sanitary and Rainwater Drain Stack

- .1 Drain stacks must be a minimum of 4" (100mm) in diameter.

1.12 Compressed Air Lines

- .1 Piping shall be seamless copper, minimum TYPE L.
- .2 Fittings shall be either wrought copper or streamlined.
- .3 Drip valves and drains to be provided at ends of lines and at low points and pockets.
- .4 Silfos solder for 100 psi or more.

1.13 Domestic Hot Water Heating Units (Water Steam)

- .1 Domestic hot water heaters to be AERCO & Armstrong Flowrite for steam conversion/steam/water.

1.14 Thermostats for Showers

- .1 Thermostats for showers are to be HANSAMAT or CRANE/POWERS by Hansa, or equivalent.

1.15 Radiator Control Valves

- .1 Every radiator is to be equipped with thermostatic radiator shut-off valve. Valves to be installed horizontally. Valve to be ARMSTRONG, HONEYWELL, JOHNSON, OR SIEMENS. (DANFOSS is not acceptable). Combine or separate remote mounted dial and sensor are no acceptable.



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DIVISION 22- PLUMBING

22 00 00

Plumbing

- .2 Thermostat is to be DELTA or SIEMENS, with electric controls.

1.16 Hand Valves

- .1 Hand valve may be ball valves (not on steam); full port required, on any branch lines (water),
- .2 High pressure steam 300# gate valves by JENKINS, CRANE OR equivalent.

1.17 Sleeves in Floor Openings

- .1 All piping crossing floors are to be equipped with waterproof sleeves, minimum 50mm high.

1.18 Mechanical Insulated Covers

- .1 Canvas covered insulation is forbidden in all service tunnels. Preferred insulation covers elsewhere to be aluminum 0.025 inch with 3 inch lap joints. Fastener bands to be stainless steel. Insulation cover to be installed everywhere, including hidden areas such as ceiling spaces and shafts.
- .2 Covers may be rigid plastic with built-in snaps provided that conformity with the minimum flame spread requirements of the NBC is respected.

1.19 Refrigerant Piping

- .1 Refrigerant piping shall be hard drawn copper tubing type K with wrought copper or tinned cast brass fittings. All joints shall be made with silver solder. Shut-off valves shall be brass globe valves with winged sealed caps.
- .2 Flexible metal hose connections shall be provided for liquid and hot gas connections.
- .3 All lines must be thoroughly cleaned during and after installation. Proper loops, traps, and piping pitch shall be maintained for proper operation of the system. Oil return must take place from cooling coils to compressor when compressor is operating at maximum unloaded conditions.
- .4 A strainer shall be installed before the control valve on any chilled water coil.

1.20 Criteria for Equivalency

- .1 Equivalent materials must be of an acceptable commercial or institutional grade and must be normally in stock at a wholesale distributor in the greater Montreal area. Present equivalent to McGill for approval.
 - .1 Flushometers: Zurn, Crane, American Standard, or Sloan



DIVISION 22- PLUMBING

22 00 00

Plumbing

- .2 Faucets: Crane, Moen, American Standard (no preference for either washerless or washered faucets)
- .3 Water Coolers: Oasis, Aquarius, Cordley or Haws
- .4 Cup Sinks: Stainless steel or polypropylene, brand does not matter.
- .5 Lab Sinks: One piece molded polyethylene, brand not important.
- .6 Lab Faucets: Waltec, Cambridge (low water use fixtures)
- .7 Steam PRV's: Fisher, Armstrong, TLV, Sarco
- .8 Steam Traps: Armstrong, TLV, Sarco
- .9 Pumps: Bell & Gossett, ITT, Armstrong, Darling Duro

1.21 Valves

- .1 Valves shall be located on every appliance, fixture, or apparatus. Valves to be located before drain-off connections. Valves to be installed on every riser branch, including a drain-off valve.
- .2 All valves shall be accessible for maintenance.

1.22 Roof Drains

- .1 No specific standard required.

1.23 Floor Drains

- .1 Deep seal trap and trap primer locate at low point in room.

1.24 Laboratory Floor Drains

- .1 Laboratory floor drains shall be avoided except for laboratory installations where significant usage of water is present. Microbiological labs for example, should not be equipped with floor drains.

1.25 Free Standing Laboratory Safety Showers

- .1 Laboratory safety showers shall be installed complete with floor drain wherever possible, and floors should be sloped towards the drain.

1.26 Floor Grille Drains

- .1 Foot grilles at the entrance lobbies of buildings should be avoided. New grilles should be installed without floor drains wherever possible. Deep pans 2" for heavy passage with anti slip surface.

1 – Deep pans 2' for



DIVISION 22- PLUMBING

22 00 00

Plumbing

2 – Anti slip surface

1.27 Water Hammer Arrestors

.1 Air chambers shall be installed at the end of all branches to all fixtures and at each fixture.

Comment [nh1]: JP standards:
Zurn Z-1700 "Shocktrol", Rototec-Smith No. 500.
Dimensions according to standard P.D.I-WH201.

1.28 Resistant Sinks

.1 Sinks shall be made to order PVC with fibreglass reinforcing or polypropylene.

Comment [nh2]: Zurn Z5114 or approved equivalent.

1.29 Water Closets

.1 Crane or American Standard and Kohler, low water use.

Comment [nh3]: Crane, American Standard, or Zurn HET EcoVantage.

1.30 Urinals

.1 Crane or American Standard, wall hung.

Comment [nh4]: Crane, American Standard or Zurn EcoVantage.

1.31 Water Lavatories

.1 Use Crane or American Standard wall hung or countertop.

Comment [nh5]:

.2 Stainless steel countertop preferred.

1.32 Slop Sink

.1 Slop sinks shall be on the floor, not raised. Materials shall be terrazzo not plastic. Any service slop sink should be floor mounted. Maximum height 4 inch (100 mm).

1.33 Eye or Face Wash

.1 Brand names, Western, Powers or Bradley.

Comment [nh6]: JP standards:
Flow-rate: 4.5L/min (0.5USGPM).
Installed between 83 cm and 115 cm, at a min.
distance of 145 cm away from nearest obstacle.

END OF SECTION 22 00 00



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying heating, ventilation and air conditioning (HVAC) work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Refrigerant Equipment

- .1 General
 - .1 Centrifugal chillers are to be preferred over single stage absorption chillers. Stand-alone rooftop glycol units are to be avoided.
 - .2 Chillers shall use 134a refrigerant or better ozone friendly for units above 100 tons, shall have proven service and reliability, parts, services, all inclusive service contract for five (5) years and a five (5) year renewal clause. No McQuay 3600 Motor chillers
 - .3 Chilled water coils shall have 25% extra capacity of refrigeration with respect to the design load required by the system.
 - .4 Avoid multicoil DX with single compressor.
- .2 Glycol Re-circulation Systems
 - .1 For glycol re-circulation systems, add expansion tanks for glycol replenishing and testing, an automatic glycol feed system to replenish glycol, a pressure transducer at the pump to monitor for low pressure and shutdown the pump, and monitoring sensor connected to the central Building Control Management System.
 - .2 Install by-pass filter on glycol and chill water loops

1.3 Heating, Ventilation, Air Conditioning Equipment

- .1 Design Control for Mechanical Systems
 - .1 The professionals responsible for system design shall inform the Executive Director Facilities Management and Development in writing whenever budgetary constraints may prevent the performance objectives of this standard form from being respected.
 - .2 Longevity and Performance Criteria for any new systems may be introduced if and only if the supplier can provide an obsolescence statement guaranteeing a minimum of ten years serviceability for the system, including freon.
- .2 General

DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

- .1 Loading docks shall be provided with air curtains or other means to minimize air infiltration and be isolated from the rest of the building. Provide minimum heating at the docks by ducting the building exhaust air to this area. (Use air curtain wall)
 - .2 Humidifiers shall be ARMSTRONG or DRI STREAM or reusable canister.
 - .3 HVAC systems shall be sized to take care of a maximum of 1.2 x ASHRAE standard.
 - .4 Perimeter rooms shall be air-conditioned with sill type grilles and ceiling diffusers (Linear).
 - .5 All mechanic HVAC equipment shall be housed in a penthouse; rooftop units shall be avoided.
 - .6 Relative pressures for labs shall be negative with respect to corridor. Intermediate and high-level radiation labs shall be negative with respect to other labs, and buildings shall be slightly negative to the outside.
 - .7 If peripheral heating is required, it should be fed from under the floor. An all-air system with a two-supply (hot and cold), one return fan dual duct variable air-column system should be supplied along exterior walls from under the floor.
 - .8 The return air would supply the hot duct 100%; excess air would supply the cold duct (with outside air).
 - .9 HVAC units shall be equipped with maintenance lighting inside each unit (energy saver long life).
 - .10 HVAC units over 6 feet tall shall be equipped with access ladders.
 - .11 HVAC motors with variable speed drives shall be configured with drives and motors from the same manufacturer, maximum 3 standards. No AC-teck drive
- .3 Mechanical Preheat or Reheat Coils
- .1 Preheat coils shall consist of integral built-in series of finned heating elements and bypasses with interlocked 16 gauge rolled form, cold rolled-steel with air dried machine enamel finish dampers to be controlled by an electric or pneumatic damper operator.
 - .2 The leakage rate of dampers shall be no more than 0.6%
 - .3 Preheat coils must have a 4-inch ASHRAE standard prefilter and velocity of air must be lower than 250 feet per minute to impede snow blockage.
 - .4 The I.F.B. (Integral Face and Bypass) preheat coil shall control air temperature with an air stream thermostat which shall not modulate the dampers to assure a constant temperature all the while maintaining full steam or water flow in coil.
 - .5 Preheat coil shall assure that in a parallel plan 915 mm (3 feet 0 inches) downstream from the coil we may obtain a maximum temperature variation of 5 degrees and a constant pressure drop and air volume (+5%) regardless of damper position.
 - .6 Preheat coil shall provide minimum stratification by creating alternate thin streams of hot and cold air that mix thoroughly downstream due to an integral face and bypass.



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

- .7 Preheat coil finned heating elements shall be fabricated of seamless return bend type copper tubes with rectangular aluminum fins spaced not closer than 10 fins per inch.
- .8 Horizontal integral face and bypass coil tubes shall be individually secured to the steam and return headers by a mechanical joint consisting of a nut and ferrule compression union to allow for individual removal of tubes in the event of damage. Tubes shall be secured against vibration by channel-shaped retainer permitting expansion and contraction.
- .9 Vertical integral face and bypass tubes shall have a 90° bend located just before the return header to ensure individual freedom of the tubes. These bends are located outside the airstreams to prevent damage to the tubes in the event of steam failure. Return headers are free to float to take up strain due to expansion. Vertical integral face and bypass shall be A.R.I. standard 410 certified.
- .10 Finned elements shall be factory tested at 200 psi steam and 500 psi hydrostatic pressure.
- .11 Preheat coil casings shall be 14-gauge steel, galvanized and painted for maximum corrosion resistance. Face and bypass channels shall be 16 gauge galvanized steel.
- .12 Headers shall be copper. Tubes shall be 16 mm (5/8 inch) minimum seamless drawn copper, thickness 0.035 minimum. Linkages shall be cadmium-placed steel drive rods with bronze bearings and operate independently of damper rods.
- .13 A strainer shall be installed before the control valve on any heating coil.
- .14 All coils shall be equipped with a vacuum breaker at the highest point.
- .15 Steam traps shall be installed with recommended slopes for drainage.
- .4 Vibration Isolators
 - .1 Vibration eliminators shall be provided for all moving equipment called for in all projects. Equipment shall be effectively isolated from the building structure to prevent undue vibration and noise transmission to the building.

1.4 Air Distribution

- .1 General
 - .1 Transformer grilles in doors or transoms are not permitted. Air transfer should be achieved by duct transfer grilles installed in ceilings, with fire dampers and provision for sound attenuation as required.
 - .2 Air intakes shall be located away from vehicle circulation areas and exhausts at roof level, not at street level for car fumes. If this cannot be done, then airflow studies should be considered with respect to the positioning of air intakes and wind.
 - .3 Air intake velocity shall be 200 feet per minute or less. All basins in air handling units shall be drained with slopes to drains.



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

- .4 Duct insulation shall be installed on the outside of ductwork. Insulation on the inside of ductwork shall be avoided. Acoustical insulation should be accomplished with silencers.
- .5 Transformer rooms shall have their own exhaust and supply with no heating to be provided.
- .6 Mechanical room and washroom exhaust fans shall be stop-start programmable.
- .7 Air supply to transformer rooms shall be filtered (standard).
- .2 Ductwork
 - .1 All new ductwork for chemical fume hood exhaust systems shall be 316 stainless steel, low carbon, round, with annealed welds; or fibreglass reinforced plastics depending on the application.
- .3 Access Doors
 - .1 Access doors shall be provided at locations in the duct systems where access to manual or automatic fire dampers, coils, thermostats or any other apparatus requires inspection.
 - .2 Doors shall be constructed with an external built-up metal frame for stiffening. Doors on insulated ductwork shall be of double panel construction provided with glass fibreboard filler.
 - .3 Access doors shall be provided ahead of all fan inlets and on both sides of all coils to allow for cleaning and inspection.
- .4 Flexible Connections and Isolating Connections
 - .1 Flexible connections shall be provided on joints between ducts and air-handling equipment. They shall be 150 mm (6 inch) wide Ventglass flexible connections. Two 13 mm (1/2 inch) wide heavy flexible braided copper conductors with clamps shall be installed to ground all systems.
 - .2 Flanges shall be provided on the ducts to make proper connections. Connections shall have a minimum of 100 mm (4 inch) between the flanges and shall be airtight. Similar connections shall be supplied for the joints between dissimilar metals in the ductwork. Flexible conductors shall be used to bridge all flexible connections in ductwork.
- 1.5 Laboratory HVAC and Fume Hood Requirements**
 - .1 General
 - .1 Laboratory HVAC systems shall be designed to meet NFPA 45 "Fire Protection for Laboratories using Chemicals" and the appropriate ASHRAE standards.
 - .2 A run-around coil-heat recovery system, heat pipe, or heat pump shall be provided between the main lab exhaust and the make-up fresh air unit.



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

- .3 Motors for hoods shall be explosion proof if the motor is located in the air stream. Metal parts are to be covered with HERESIDE coating.
- .2 Laboratory Fume Hoods
 - .1 New fume hoods shall be inspected and approved by a qualified expert before start-up
 - .2 Hot lab radioactive exhausts and biohazard exhausts shall run continuously.
 - .3 Only hot lab exhausts shall be connected to emergency power.
 - .4 Design Configuration: variable air volume, air foil or bevelled sides and sill shatterproof sash, adjustable upper and lower baffles, hood work surface recessed (dished) to contain liquid spill, electrical outlets and utility valves on exterior face, ground fault interrupter on electrical outlet circuit.
 - .5 Radioactive Hoods shall have non-porous interiors (e.g. stainless steel) and activated charcoal filters for iodination experiments (for other radioisotopes, consult with Radiation Safety Officer).
 - .6 Fume Hood shall be located as far away as possible from doors and zones of pedestrian traffic.
 - .7 No return air diffuser should be located within a radius of 10 feet from a fume hood.
 - .8 All fume hoods shall be equipped with a flow monitor, SIEMENS or PHOENIX. The response time with respect to the opening or closing of the hood sash shall be two seconds or less.
- .3 Fume Hood Exhaust
 - .1 All fume hood discharge shall be vertical. Fume hood stacks shall be a minimum of 10 feet tall with a discharge outlet no less than 10 feet above the roof deck.
 - .2 Fume hood outlets shall be a minimum of 25 feet away from any adjacent window or air intake.
 - .3 Chemical exhaust outlet velocity shall be 4,000 fpm., minimum, for ventilated cabinets.
 - .4 Fume hood exhaust outlet velocity shall be 6,000 fpm., minimum.
 - .5 Fume hood exhaust ducts shall be stainless steel (verify type).
- 1.6 **Testing, Adjusting, and Balancing**
 - .1 General
 - .1 After renovations, all HVAC systems affected by the change shall be checked and balanced.
 - .2 Commissioning of new HVAC systems shall wait until all construction work is complete and all dust and dust sources have been cleaned-up and eliminated.
 - .3 Air handling units shall not be turned on during construction.



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

- .4 Filters on the return air shall be changed after construction is finished and before final balancing.
- .5 Final inspections shall be made to assure after start-up that filter frames are not damaged, ducts are clean, balancing is correct.
- .2 **Balancing and Testing**
 - .1 All air handling units and their respective distribution networks shall be balanced for air quantities as shown on the engineering drawings.
 - .2 Trades shall provide all belts and pulleys required for balancing all fan systems.
 - .3 Trades shall submit all testing and balancing results on 8.5 x 11 inch sheets with cross-referenced drawing showing diffuser location and air quantities removed.
 - .4 Fan test shall be submitted. The whole shall be bound in a title binder with hard fibreboard cover.

END OF SECTION 23 00 00

DIVISION 23- HEATING, VENTILATION AND AIR CONDITIONING

23 11 23 Laboratory piping for gases

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying laboratory piping for gases work. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements for new or renovated laboratories

- .1 Each point of supply into a laboratory of natural gas, Liquefied petroleum gases or compressed gases shall be provided with labels identifying the gas
- .2 Each work station valves of natural gas, liquefied petroleum gases or compressed gases shall be color coded for the identification of the gas.
- .3 Each point of supply into a laboratory of natural gas, Liquefied petroleum gases or compressed gases shall be provided with an indicating manual shut off valve. For flammable or corrosive gases, it is to be located in a safety cabinet with a transparent door (breakable for emergencies).
- .4 In new constructions and if possible, with renovations, the laboratory main control valve for these gases will be located in the corridor near the entrance to the lab.
- .5 Adequate provisions for the storage of compressed gases must be made with the following restrictions. The cylinders may never be located
 - .1 in any exits or corridor providing access to exits
 - .2 under any fire escape, outside exit stair, passage or ramp, or
 - .3 within 1 meter of any exit.

END OF SECTION 23 11 23



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 38 17

Chemical Fume Hood

Part 1

General

1.1 Summary

- .1 In general, follow the standards below when specifying chemical fume hood modifications or installations. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 Tests shall be conducted with the laboratory activity in a normal state.
- .2 All HVAC systems shall be complete and in normal operation test.
- .3 Position of the sash shall be at the specified opening.
- .4 Measure 1.0 ft.² grid pattern across the sash openings by equally dividing the opening into vertical and horizontal dimensions.
- .5 With the sash fully open, obtain face velocity readings at the center of each grid space by holding the anemometer in the plane of the hood sash and perpendicular to the sash opening (standing to the side).
- .6 Per ANSI/ASHRAE 110-1995 the average face velocity shall be calculated.
- .7 Record fume hood information on the field data sheet.
- .8 Repeat steps 4 through 7 lowering the sash until the average face velocity is 100 fpm. Record the sash height on the field data sheet. NOTE: if the sash opening is less than 14 inches, the fume hood shall be deemed inoperative and a "DO NOT USE" notice posted.
- .9 Lower sash to 50% opening and repeat measurements.
- .10 Conduct a pencil smoke test, release smoke around the sash and under sash bar and ventilated cabinet if any,
- .11 Fume hood test data shall be entered from the field data sheets into the computer database; and, any corrections or needed repairs shall be noted and appropriate action taken.
- .12 Post certification stickers with fume hood test results.



DIVISION 23- HEATING, VENTILATING AND AIR CONDITIONING

23 38 17 Chemical Fume Hood

- .13 Post and arrow label indicating the maximum sash opening at the height at which 100 fpm is achieved.
- .14 Apply a similar label to indicate position of dampers if applicable.
- .15 Determine fan static pressure, rotational speed of fan impeller, fan motor current and voltage and compare with manufacturer's fan curves.
- .16 Record all reading on an approved report form.
- .17 In addition to the paper document, a PDF document is required.

1.3 Fume Hood Face Velocity Verification

- .1 McGill chemical fume hoods will be evaluated annually according to the following:

Criterion	Standard
Instrument	Shortage AMD 860 air meter or approved equivalent
Grids	At least two; no greater than 12" x 12" in size
Average Face Velocity	100 FPM +/- 10 fpm for conventional systems 90 fpm +/- 10 fpm for VAV systems with air flow indicators and alarms
Range	No measurement <10% of average; <15% variation point to point
Baffles, dampers	Adjust for uniform flow if necessary
Smoke	Use smoke pencil to verify the hood as directed
Identification	Hoods that pass will be labelled in with the hood number, average face velocity, and date of test and be labelled with an arrow indicating the sash height that should not be exceeded.
Fan Characterization	Measure and record fan performance

END OF SECTION 23 38 17



DIVISION 25- INTEGRATED AUTOMATION

25 00 00 Integrated Automation

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying Integrated Automation. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design requirements

- .1 In general, individual room temperature control shall be provided.
- .2 Room thermostats to be located away from heat sources like photocopiers, faxes, computer servers. Thermostats to be equipped with vandal proof guards everywhere. Thermostats to be electronic connected to the Building Management System.
- .3 If peripheral heating is required, the zone control must be configured to allow temperatures to be reduced by 5°-10°C during unoccupied hours. (365 day programmable schedule). Each room or zone should have a thermister type temperature sensor, no occupant adjustable thermostat.
- .4 Pneumatic controls shall be used only where the renovations are minor and the existing system is pneumatic.
- .5 Air handler drivers shall be electric with an overload capacity of 50%.
- .6 Exhaust from transformer rooms shall be equipped with a high-low temperature monitor and a temperature controlled fan or damper.

1.3 Controls

- .1 HVAC controls shall be electronic (SIEMANS, APOGEE or DELTA), connected to McGill main SIEMANS or DELTA computer via University fibre optic backbone.
- .2 When a zone is not occupied, in general, no heating/cooling ventilation will be supplied to this zone. A low temperature limit, 10-15°C, will bring heating back to maintain this limit.
- .3 The hot deck/cold deck temperature will be optimized based on zone demands (floating set-points instead of fixed 110° F hot deck/55° F cold deck).



DIVISION 25- INTEGRATED AUTOMATION

25 00 00 Integrated Automation

- .4 The whole heating, ventilation and air conditioning system shall be programmable, i.e. for unoccupied period, economy cycle, free cooling when possible, optimized stop start. Provide schedule from clients.

1.4 Energy Management System

- .1 All energy devices are to be hooked up to the central diagnosis system on the Ethernet backbone.
- .2 Electric meters are to be POWER MEASUREMENT.
- .3 Vortex steam meters are to be EMCO.
- .4 Steam condensate meters to be MAGFLOW.

END OF SECTION 25 00 00

26 05 01 Common Work Results - Electrical

Part 1 General**1.1 Summary**

- .1 In general, follow the standards below when specifying common electrical works results. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Wiring Methods

- .1 General
 - .1 Auxiliary contacts shall be provided when connecting to the HVAC controls.
 - .2 Empty conduit from newly installed Flush panels to ceiling space 1 inch x 1-1/2 inch as a minimum.
 - .3 All wiring shall be copper, solid for #12 AWG or smaller, stranded for #10 AWG and larger.
 - .4 No conduits shall be installed in concrete slabs.
- .2 Meters
 - .1 Meters should be installed on all 600V feeders to buildings. Meters shall be "POWER MEASUREMENT" brand type 7300 only.
 - .2 Proper metering shall include both Amperage and Voltage. Demand and Consumption shall be indicated on direct digital output.
- .3 Rigid Conduit
 - .1 The minimum acceptable size to be 19mm (1/4 inch) diameter.
 - .2 Acceptable material to be thin-wall electrical conduit (EMT) or high-density polyethylene (HDPE). Polyvinyl chloride (PVC) conduits are not acceptable.
 - .3 For outdoor locations or hazardous area locations, the use of rigid threaded galvanized steel conduits is recommended.
- .4 Transfer Switches
 - .1 Acceptable brands include:
 - .1 ASCO
 - .2 SQUARE D
 - .3 WESTINGHOUSE
 - .4 ONAN
- .5 Labelling of Panels and Equipment



26 05 01 Common Work Results - Electrical

- .1 All circuits are to be labelled. All appliances are to be labelled as well, including duplex outlets, and light switches.
- .2 All junction boxes and pull boxes to be labelled. Identify service panel, circuit, or system/equipment name.
- .6 Emergency Circuits
- .7 All emergency circuits, outlets and cabling are to be identified in red. Fixtures are to be identified as well.
- .8 Generators
 - .1 Acceptable manufacturers are:
 - .1 ONAN
 - .2 KOHLER
 - .3 CATERPILLAR
 - .4 GARRETT
 - .5 PRATT & WHITNEY
 - .2 New generators should be supplied with a service contract of 3 years minimum.
- .9 12KV Sub-Stations
 - .1 Central alarm reporting to McGill Security should be provided for intrusion, flood, high temperature, transformer gases, fire.
- .10 Hidden Junction Boxes
 - .1 To be avoided. All junction boxes must be accessible. Electric fire shutters are a particular problem.
- .11 Service Tunnels
 - .1 To be equipped with waterproof duplex power outlets (110V-20A) every 15m (50 feet).
 - .2 To be equipped with fluorescent light fixture with wire guard protection every 9m (30 feet).
- .12 Flood Alarms
 - .1 To be installed in all low areas and near electrical equipment.
- .13 Motors
 - .1 All heating, ventilating, air-conditioning equipment, fans and pumps shall have an automatic start.
 - .2 All motors over ½ hp to be 550/3/60 c/w auto start.
 - .3 All motors over 1 hp to have thermister over protection.



26 05 01 Common Work Results - Electrical

- .14 Electric Outlets in Corridors
- .15 Provide 110V 20A outlets in corridors on 50 foot (15 m) intervals. Circuits shall be colour coded for custodial and autonomous from other circuits. Clearly identify circuit at outlet and at panel.

1.3 Lighting

- .1 General
 - .1 All lighting shall be fluorescent.
 - .2 No incandescent lamps shall be used, unless noted otherwise.
 - .3 General lighting in each zone shall be on separate circuits.
 - .4 Automatic infrared sensors shall be installed for rooms over 200 sq. ft, 20m².
 - .5 Number of light fixtures shall be determined according to the following standards:
 - .6 Offices: 0.65 to 1.0 watts per sq. ft. (T-8 tubes and electronic ballasts)
 - .7 Research Labs: 1.0 to 1.5 watts per sq. ft. (T-8 tubes and electronic ballasts)
 - .8 Building lighting should not be elevated more than 20 feet above the ground; and shall be equipped with electronic ballasts, and fluorescent lamps 32W warm white.
 - .9 If 50% of the building lighting is new, 347V lamps shall be used. In retrofits, 120V lamps as existing shall be used.
 - .10 Exterior lights shall be high-pressure sodium-vapour.
 - .11 Corridors shall have warm white fluorescent tubes.
 - .12 Working areas shall have warm white fluorescent tubes.
- .2 Mixed Voltage for Lighting
 - .1 Whenever mixed voltage occurs for lighting in a building, all panels, existing and new, and circuits must be identified as to voltage type. E.g. 347V vs. 120/208V
- .3 Fluorescent Fixtures
 - .1 2 x 2 fluorescent fixtures with U tubes should be avoided.
 - .2 All fixtures to have T-8 high efficiency ballasts.
 - .3 Fluorescent fixtures should be 4 foot, or 2 feet x 2 feet straight tube fixtures.
- .4 Parabolic Diffusers
 - .1 New diffusers should be parabolic type. Parabolic diffuser grilles should be no smaller than 1 ½ inch x 1 ½ inch (38 m x 38 m). Diffusers with a small grid cut too much light.

END OF SECTION 26 05 01



26 50 00

Lighting

Part 1 General

1.1 Summary

- .1 In general, follow the standards below when specifying lighting. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Types of Intervention

- .1 Lighting at McGill is divided into four (4) categories:
 - .1 Maintenance
 - .1 Replacement of existing components with items of equal or superior quality.
 - .2 Retrofit
 - .1 Addition or replacement of existing components to existing equipment.
 - .3 Renovation
 - .1 Replacement of existing equipment with new, more energy efficient equipment.
 - .4 New constructions
 - .1 Supply and installation of new equipment.

Part 2 Products

2.1 Compact Fluorescents

- .1 Compact Fluorescent Lamps (CFL's) to have an equivalent wattage of approximately 25% of the existing incandescent lamp. Ex. 100W incandescent = 25W CFL. Lumens equivalency must be maintained.
- .2 Acceptable CFL's to be either pin type (2 or 4) or threaded socket type, and not exceed the reflector, fixture diffuser, or decorative shade.
- .3 Correlated Color Temperature (CCT) to be one of the following, according to usage:
 - .1 3000°K – Warm white
 - .2 3500°K – Neutral white
- .4 CFL's to have a minimum average lamp life of 12,000 hours.



26 50 00

Lighting

- .5 Compact fluorescents should meet 250 pg/lh (pictograms/lumens-hour) mercury content standard as defined by LEED EB. GE, OSRAM and Philips all provide accessible data to meet this standard. All other manufacturers must submit mercury content for approval.

2.2 Incandescent and IR Halogen Lamps

- .1 These lamps are to be used in the following spaces:
 - .1 In spaces where dimming is currently implemented.
 - .2 In display uses where directional sources are required.

2.3 Metal Halide Lamps

- .1 For exterior use, metal halide lamps are recommended.

2.4 Linear Fluorescent Lamps

- .1 Use of "U" tube fluorescent lamps is not permitted.
- .2 Approved linear fluorescent lamps are as follows:
 - .1 T8 - 28W – 48" (1220mm) Lg.
 - T8 - 25W – 36" (915mm) Lg.
 - T8 - 17W – 24" (610mm) Lg.
 - 30,000 hours of minimum average lamp life.
 - 3000°K – Warm white
 - 3500°K – Neutral white

For new constructions, or for a special application and following evaluation by McGill University, the following fluorescent lamps may be specified:

- .2 T5 HO - 54W – 45" (1163mm) Lg.
- T5 HO - 39W – 33" (863mm) Lg.
- T5 HO - 24W – 22" (563mm) Lg.
- 24,000 hours of minimum average lamp life.
- 3000°K – Warm white
- 3500°K – Neutral white
- .3 Existing T12 fluorescent lamps to be replaced with the T8 lamps only. Length of lamps will remain the same. In this case, replacement of ballasts and sockets is also required. See article 2.5.



26 50 00

Lighting

- .4 Compact fluorescents should meet 250 pg/lh (pictograms/lumens-hour) mercury content standard as defined by LEED EB. GE, OSRAM and Philips all provide accessible data to meet this standard. All other manufacturers must submit mercury content for approval.

2.5 Ballasts and Light Sockets (Existing Fixtures)

- .1 Existing T12 fluorescent light fixtures to be retrofitted with new high efficiency rapid start electronic ballasts, with a ballast factor of 0.77 or lower, a power factor of 90%, and a total harmonic distortion (THD) of 10% or less. The use of a continuous wire, without splices and with marrettes is required.
- .2 No magnetic ballasts will be accepted.

2.6 Ballasts (New Fixtures)

- .1 New fluorescent light fixtures to be equipped with high efficiency rapid program start electronic ballast, with a ballast factor of 0.77 or lower, a power factor of 90%, and a total harmonic distortion (THD) of 10% or less.

2.7 Louvers, Lenses, and Diffusers

- .1 New light diffuser louvers to be parabolic (Acrylic) with a cell size of 1½" x 1½" x 1" (38mm x 38mm x 25mm) (Silver metalized finish).
- .2 New light diffuser lenses to be clear acrylic prismatic 0.125" (3mm) thick.

2.8 Fixtures

- .1 All fixtures are to be certified BU UL, cUL, ETL, CSA, or other nationally recognized independent testing laboratory.
- .2 Fixtures should be manufactured or assembled within a 500 mile radius, (as per LEED NC awards points under the MR5.1.5.2 credits for locally sourced materials) unless no equals are to be found. Preference should be given to Quebec based manufacturers.
- .3 Quantity of light fixtures and lamp wattage shall provide +/- 10% illumination adequate to meet the IESNA (Illumination Engineering Society of North America) values as set out in the IESNA handbook, 9th edition, 2000.

A summary of table "IESNA Lighting Design Guide" follows:

(Spaces not listed in the summary below should be looked up in the IESNA handbook).



DIVISION 26- ELECTRICAL

26 50 00 Lighting

Classrooms	See “Classroom Lighting Guidelines”
Corridors	10 Foot Candles (100 Lx) Horizontal
Offices	30 to 50 Foot Candles (300 to 500 Lx) Horizontal 5 Foot Candles (50 Lx) Vertical
Conference Rooms	30 to 45 Foot Candles (300 to 450 Lx) Horizontal 5 Foot Candles (50 Lx) Vertical
Gymnasiums	100 Foot Candles (1000 Lx) Horizontal 30 Foot Candles (300 Lx) Vertical
Laboratories	50 to 55 Foot Candles (500 to 550 Lx) Horizontal 30 Foot Candles (300 Lx) Vertical
All Egress Routes	1 Foot Candle (10 Lx) Horizontal

- .4 All spaces (offices, classrooms, conference rooms, etc.) must meet audio-visual (AV) requirements as outlined in the McGill AV guidelines when use/occupancy demands audio-visual considerations (dimming, projection, controls, etc.).
- .5 Exterior fixtures to be weather proof and dark sky compliant with an IP rating of 68. Pole mounted fixtures, ballasts, and controls must be accessible by a secure (locked) access trap door located below 2400mm (8' - 0”).
- .6 When available, energy star rated appliances are to be preferred.



DIVISION 26- ELECTRICAL

26 50 00 Lighting

Part 3

3.1 Table of interventions v/s Products

Interventions	Products (See articles)
Maintenance	2.1, 2.2, 2.3, 2.4.1, 2.4.2, 2.5, 2.7
Retrofit	Same as maintenance + 2.4.1, 2.4.3, 2.5
Renovation	Same as Retrofit + 2.6, 2.8
New Construction	Article 2

3.2 Light fixtures disposal

- .1 For the disposal of light fixtures, fluorescent tubes and light bulbs, refer to Section 01 74 21—Construction/Demolition Waste Management and Disposal.

END OF SECTION 26 50 00

28 31 01 Fire Alarm Systems

Part 1 General**1.1 Summary**

- .1 In general, follow the standards below when specifying fire alarm protection modifications or installations. All requirements outlined herein shall be reviewed with the McGill University Fire Prevention Office (FPO) and confirmed before the commencement of any fire alarm system design, installation or modification.
- .2 Even if not required by the Quebec construction code and/or municipal legislation, renovations shall never reduce the protection level that was prevailing before their start.

1.2 Design Requirement

- .1 Clearly indicate items or equipments to be relocated. Indicate their actual and future location.
- .2 Indicate to protect existing items designated to remain and items designated for salvage
- .3 The system drawings must include the wiring schematic of the alarm system.

1.3 Required Documentation

- .1 As-built drawings of the fire alarm system modifications/installations shall be provided to the FPO, Facilities Development Project Manager and Facilities Operations. The drawings must include the wiring schematic of the alarm system
- .2 The "fire layer" of the AutoCAD floor plans (available from Facilities Development) will be prepared indicating the location, types and address of every device in the fire alarm system. Copies will be provided to the FPO.
- .3 Notification of the tests described in section 3.0 shall be given to the McGill University representatives, at least 5 working days in advance and all interested parties shall be contacted, including:
 - McGill University Fire Prevention Officer
 - Facilities Management Electrical Trades Supervisor
 - Facilities Development Project Manager
- .4 A printout of all fire alarm points will be provided on paper and electronically to FPO.

28 31 01 Fire Alarm Systems

- .5 A copy of the fire alarm system computer program will be provided with the data from the final installation for future modifications.
- .6 The installing contractor shall provide all literature and instruction manuals, in French and English, on paper and electronic version, provided by the manufacturer and describing proper operation and maintenance of any equipment and devices installed.

1.4 Restriction

- .1 Work on existing systems must be coordinated with McGill Facilities Supervisors, the Project Manager and the FPO.
- .2 Specify the period of the day for work, to avoid noise in the building (ex.: bell testing).
- .3 In coordination with the Project Manager, specify the path to evacuate garbage. All materials that are recyclable should be pointed out to the Project Manager for recycling through either Building Services or the Waste Management Program.

Part 2 Products

2.1 Fire alarm Control Panels (FACP)

- .1 All materials used for the project must be new.
- .2 All fire alarm system components, must be ULC listed for use on a fire alarm system
- .3 The FACP shall be located at the main entrance of the building and shall not be located within offices, mechanical rooms or other areas that require keys to access.
- .4 The FPO shall verify the location of the FACP.
- .5 Edwards, Simplex and Notifier are presently the 3 brands of FACP installed in McGill buildings. Models shall be selected with FPO consultation to suit the present and future building needs.
- .6 All new FACP will be fully addressable.
- .7 All panels will be provided with a "Fire Drill Switch" (key or button). This device will activate all alarm circuits; magnetic door release, hold open and elevator recall relays.
- .8 Provisions shall be made to allow for the bypass of all auxiliary relays for the purpose of periodic fire alarm testing.

28 31 01 Fire Alarm Systems

- .9 All panels for high-rise buildings will be provided with a communication system, as specified in the Quebec Construction Code.

2.2 Annunciators

- .1 Remote annunciators shall be provided in locations identified by the FPO, as deemed necessary.
- .2 Remote annunciators (located in the same building) will be provided with remote reset and silence switches, unless specified by FPO.

2.3 Monitoring

- .1 Each individual FACP shall be monitored by McGill's current Central Monitoring Station which shall be ULC listed.

2.4 Labelling

- .1 The FPO will verify all zone and point/device labels.
- .2 All zone and point/device labels and all panel controls and labels shall be in English.
- .3 All devices are to be provided with external labels in conformance with the FACP listing.

2.5 Power Supply

- .1 In the event of a failure of the primary power supply to the FACP, the backup power supply shall be able to provide at least 24 hrs of operation under supervisory mode followed by at least 5 minutes of operation under full alarm load conditions. If the building is a high rise building, the power supply shall maintain a continuous alarm load for at least 20 minutes after 24 hours in a supervisory mode.
- .2 The branch circuit breakers on the power supply to the FACP and the Central Monitoring Station equipments shall be painted red placed on 2 independent circuits properly labelled and provided with tamper locks.

2.6 Manual Pull Stations

- .1 Manual pull station mounting height shall conform with the McGill accessibility standard for switch height (1070 mm or less). Permission must be sought from the authority having jurisdiction (AHJ) in order to deviate from CAN/ULC-S-524 installation standard
- .2 Pull stations will be equipped with tamper switch devices where deemed necessary by the FPO.

28 31 01 Fire Alarm Systems

- .3 Pull stations will be of the outdoor type for all areas of high humidity level, where “wash downs” may be required as in parking garages.
- .4 Design will include the signage of the pull stations, according to McGill signage standard.

2.7 Signalling devices

- .1 The ISO 8201 (current edition) “Acoustics-Audible emergency evacuation signal”, clause 4.2 “Temporal Tone” standard will be used for all signalling devices to indicate an alarm signal.
- .2 The contractor to ensure that all areas have a minimal sound pressure level of 15 dBA above the ambient noise level but never less than 65 dBA will verify sound output of the installed devices. At no time should sound levels exceed 95 dBA (refer to QCC, current edition).
- .3 When 2 doors separate an area from a corridor where a signalling device is installed, an additional device shall be installed in this area.
- .4 All signalling device shall be of the combined type (audible and visible device), unless deemed acceptable by the FPO
- .5 Upon renovations, additional visual signalling device will be installed in all assembly occupancies (clubs, bars, dance halls, theatres, etc) where noise levels may exceed 100 dBA from music or other noise, in all floor areas (ex: mechanical rooms) where ambient noise level exceed 87 dBA and in areas where occupants hearing capacity is reduced (ear protectors, audiometric booth, sound insulating enclosures).

2.8 Alarm device restrictions in specific areas

- .1 The Animal Research Centre will be contacted to determine any special auditory or visual warning device settings that may be required to accommodate animal research. The sole use of visual warning devices may be authorized by the AHJ for certain animal research areas. Different sound frequencies may be selected for alarm notification. Contact the FPO for further information.

2.9 Thermal detection

- .1 Rate of rise detectors shall be installed unless otherwise specified by FPO.
- .2 In areas where rapid changes of temperature are experienced and expected under normal condition, such as loading docks, autoclave rooms, kitchens, kitchenettes, etc... fix temperature detectors shall be installed.

2.10 Smoke detection

- .1 Smoke detectors will be ceiling mounted unless otherwise specified by FPO.

28 31 01 Fire Alarm Systems

- .2 Smoke detectors required in stair shafts will be located over the landing area at the top of the stairs. For staircases of over 18 m in height, additional smoke detectors will be installed every 3 stories, under the above landing.
- .3 Smoke detectors located in elevator shafts will be designed so that the unit may be removed via the shaft wall to facilitate replacement or maintenance (see FPO for details)
- .4 Addressable smoke detectors located in inaccessible areas will be provided with remote LEDs to indicate alarm and polling status (ex: elevator shafts)
- .5 Smoke detectors shall be installed in server rooms.

2.11 General Options

- .1 Addressable smoke and thermal detectors shall be provided with dual (2) status LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the FACP. Both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. If required, the flashing mode operation of the detector LEDs can be programmed off via the fire control panel program.
- .2 Programming of the FACP shall be possible from the panel keypad.
- .3 All panels shall be able to read historical events (history log of alarm, trouble and reset signals) using the panel keypad (integral part of the system) without the use of special device such as a laptop computer. This feature shall be included with all panels.
- .4 "Compare Software" shall be available within the distributor to allow for verification of programming modifications to the fire alarm system.

2.12 Supervision of devices and auxiliary equipments

- .1 All control valves for sprinkler and standpipe systems and sprinkler system pressure variation sensors will be provided with electronic supervision that will cause transmission of a supervision signal to the FACP which will then be transmitted to the Central Monitoring Station.
- .2 All flow switches for sprinkler and standpipe systems will be provided with electronic supervision that will cause transmission of an alarm signal to the FACP which will then be transmitted to the Central Monitoring Station.
- .3 Loss of power to any required fire pump driver will cause transmission of a trouble signal to the FACP which will then be transmitted to the Central Monitoring Station.
- .4 Fire pump running will cause transmission of an alarm signal to the FACP which will then be transmitted to the Central Monitoring Station,

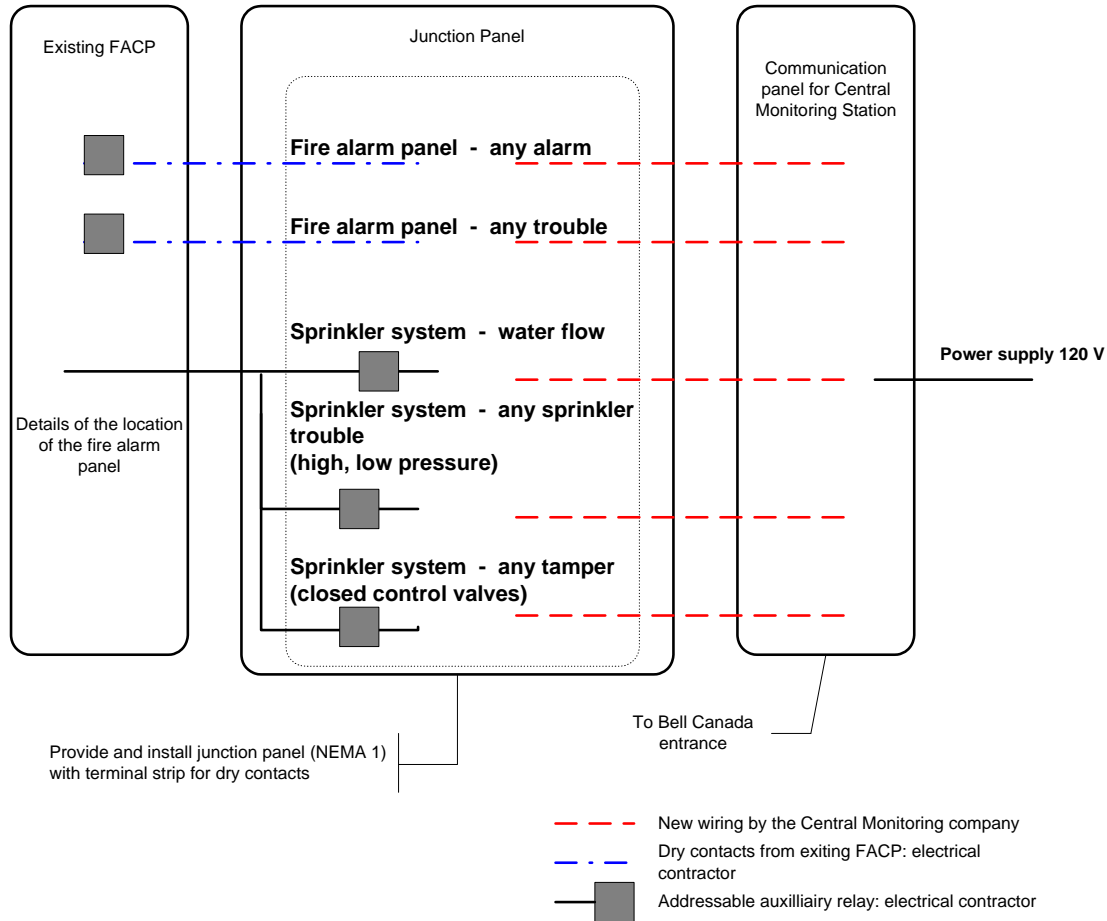
28 31 01 Fire Alarm Systems

- .5 Offline condition of emergency power generators will cause transmission of a trouble signal to the FACP, which will then be transmitted to the Central Monitoring Station.

2.13 Connections for the monitoring company

- .1 A junction panel (NEMA 1) with a terminal strip for dry contacts for all the elements requiring supervision must be included in the alarm system design. The monitoring company will be asked to connect their equipment to this junction panel to avoid any work being done within the fire alarm panel by this company.
- .2 Attached sample diagram of the required set up for the monitoring of the fire alarm system and sprinkler systems. The same type of set up would be required for additional monitoring points such as fire pump running, power off to the fire pump and water flow in standpipe and hose systems as determined by the FPO.

28 31 01 Fire Alarm Systems



- .3 If the contacts are not available at the fire alarm panel, additional addressable auxiliary relays will need to be requested for the FACP. The FACP will need to be programmed to activate the auxiliary relays, as indicated in the sketch, and the dry contacts wired onto the terminal strip in the new junction panel.
- .4 All auxiliary relays and dry contacts are to be clearly identified.
- .5 The wiring between the fire alarm panel and the new junction panel must be EMT.

28 31 01 Fire Alarm Systems

- .6 Testing of the programming of the dry contacts must be done by initiating at least two devices that are to provide the signal. Testing will be done according to CAN/ULC-S537. The contractor shall submit a verification report.
- .7 McGill's monitoring company is to provide a communication panel that will transmit information from the fire panel. The information is provided by dry contacts located in the junction panel.
- .8 McGill's monitoring company is to wire the dry contacts from the terminal strip in the junction panel to the communication panel. All wiring must be clearly identified.
- .9 All wiring between the junction panel and the communication panel must be in EMT.
- .10 The design must include a power supply for the monitoring panel and McGill's monitoring company is to connect the panel to it.
- .11 The exact location of the panel will be determined on site with the FPO. If possible, it will be in proximity to the fire alarm panel; probably above its location.
- .12 The monitoring company will be providing dry wires for DVAC near the panel leading to the Bell Canada entrance. The monitoring company shall connect the line to Bell Canada DVAC and provide the DVAC line.
- .13 The monitoring company must test the programming of the panel by initiating at least one device of each type of signal to be transmitted. Testing from the junction box is insufficient.
- .14 The monitoring company must provide a testing report.

2.14 Keys

- .1 At least 5 sets of keys for panel access will be provided to McGill University, as well as any other keys required to operate any other functions of the fire alarm system and monitoring equipment.
- .2 Keys will be given to Security and Fire Prevention Services for distribution.
- .3 Magnetic locking devices
- .4 Magnetic locking device installation is not accepted anymore in McGill's buildings unless specifically discussed with FPO and for very special circumstances where no other alternative is possible.
- .5 Existing equipment
- .6 All existing equipment removed during installations, upgrades and modifications shall be returned to the Facilities Management Electrical Shop.

28 31 01 Fire Alarm Systems

2.15 Training

- .1 Training will be provided on-site by the Contractor for all McGill staff who require training in the operation and maintenance of the fire alarm equipment in question. Courses will be provided in English unless requested otherwise.

Part 3 System acceptance

3.1 System Operational tests

- .1 Upon completion of the system installation and when subsequent modifications are made, the Contractor shall completely test the system in the presence of the owner's representative(s)
- .2 Those tests shall comply with CAN/ULC –S-537, current edition, and paper and electronic copies provided to those mentioned in section 1.4.3

END OF SECTION 28 31 01



DIVISION 32- EXTERIOR IMPROVEMENTS

32 37 00 Exterior Site Furnishings

Part 1 General

1.1 Summary

- 1.1 In general, follow the standards below when specifying metal laboratory work and storage cabinets. Unless otherwise indicated, these standards are not intended to restrict or replace professional judgment.

1.2 Design Requirements

- 1.1 All site furnishes shall meet the campus standards and shall be reviewed by McGill University's Garden and Grounds Committee, and the Architectural Advisory Committee.
- 1.2 Coordinate benches, garbage bins and other exterior furnishings to match, in area to be installed or change.

Part 2 Products

1.1 Garbage bins

- .1 For all new garbage bins, specify R31-1 (Carriage Lane Series) by "Frances Andrew" or RS-12 (Concourse Series) by Victor Stanley. Specify Black/Gloss Black for finish.



RS-12 Concourse Series by Victor Stanley



R31-1 Carriage Lane by Frances Andrew



DIVISION 32- EXTERIOR IMPROVEMENTS

32 37 00 Exterior Site Furnishings

- 1.2 Benches
 - .1 For all new benches, specify CL31-3A or CL-31-5A (Carriage Lane Series) by Frances Andrew. Specify Black/Gloss Black for finish.
 - .2 Costume designed, or integrated benches may be used, but design must be approved by Architectural Advisory Committee.
- 1.3 Ashtray
 - .1 Urban ashtrays must be installed at 9m radius from main entrance
 - .2 Depending on location, use either Tower model or Wall Mounted model by "I Kkit" with Gloss black finish. Size may vary with location.
- 1.4 Bike racks
 - .1 All new bike racks shall be L21 (Loopy Series) as manufactured by Frances Andrews, with black/gloss finish or approved equivalent.
- 1.5 Streetlamps
 - .1 Historic-period lamps
 - .2 Bollard/lights
- 1.6 Bollards
 - .1 May install Fixed bollards or Automatic Retractable Bollards as manufactured by Urbaco or approved equivalent.

END OF SECTION 12 90 00