Hearing Conservation

Office of Risk Management

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Contents

SCOPE

This document is intended for all workers, students, contractors, and all other persons who may work in an environment considered hazardous to their hearing and includes conditions produced via research activities. This program was developed jointly by the Office of Risk Management, Facilities, and the Health and Wellness Office at Human Resources. For information on specific program elements, please contact the appropriate sector.

For all employee health-related concerns, or for audiometric testing information, please contact the Health and Wellness Sector, Human Resources at ext. 1473 or by email at hrhealth@uOttawa.ca.

For requests for basic sound level testing, information on hearing protection devices, or information on Ontario legislation, contact the Office of Risk Management at ext. 5892 or by email at safety@uottawa.ca.

ONTARIO LEGISLATION

Requirements for sound levels in the workplace are covered in Regulation 381/15, which is made under the *Occupational Health and Safety Act*.

Definitions

"Decibel" means a unit of measurement of sound pressure level that is equal to 20 times the logarithm to the base 10 of the ratio of the pressure of a sound, divided by the reference pressure of 20 micropascals.

“dB(A)” means a measure of sound level in decibels using a reference sound pressure of 20 micropascals when measured on the A-weighting network of a sound level meter.

“Continuous noise” means sound that has unbroken sound waves.

“Intermittent noise” means sound that has broken or interrupted sound waves.

“Noise” means unwanted sound. Sounds travels in waves, similar to dropping a rock in the middle of a still body of water; the water ripples outward from the source.

“Sound” means oscillations in pressure above and below ambient atmospheric pressure.

Regulation 381

Section 2(1) - Employers must take all measures reasonably necessary to protect workers from exposure to hazardous sound levels.

Section 2(2) – Employers must follow the hierarchy of controls (first use engineering controls, then work-practices, then PPE).

Section 2(3) – Any measurement of sound levels in the workplace that is conducted to determine which protective measures are appropriate shall be conducted without regard to any use of personal protective equipment.

Section 2(4)(2) – Every employer shall ensure that no worker is exposed to a sound level greater than or equivalent to 85 dB(A) $L_{ex,8}$

In Ontario, an "equivalent exposure" is based on a 3-decibel exchange rate. This means that when a given exposure time is halved, the allowable exposure level is increased by 3 decibels.[1] Please see the chart below for a comparison.

Exposure Time	Decibel Level
16 hours	82
8 hours	85
4 hours	88
2 hours	91
1 hour	94
30 minutes	97
15 minutes	100

Where a worker is exposed to a steady sound level throughout their shift, the exposure duration must not exceed the value for that sound level in the above Table. Once the worker has reached the permissible duration for that sound level, the worker's noise exposure has reached 100% of the permissible daily noise dose. For example, if a worker is exposed to a steady sound level of 91 dBA, the maximum permissible daily exposure duration is 2 hours. Multiple different sound levels may culminate and exceed a daily dose.

Section 2(6) – Whenever possible, employers shall protect workers by using engineering controls rather than using personal protective equipment.

If engineering controls are:

a. Not in existence or not obtainable
b. Are not reasonable or not practical to adopt, install or provide because of the duration or frequency of the exposure or because of the nature of the process, operation or work
c. Are rendered ineffective because of a temporary breakdown of such controls
d. Are ineffective to prevent, control or limit exposure because of an emergency

Workers shall wear and use hearing protection devices appropriate in the circumstances to protect them from exposure to a sound level greater than the limit.

Section 2(7) – A clearly visible warning sign shall be posted at all approaches to an area where the sound level **regularly** exceeds 85 dB(A). *Note – uOttawa has adopted a more conservative level of 80 dB(A).*

Measurement

Workplace sound levels are measured in decibels on the A-weighting network; this network closely resembling human hearing.

To calculate an equivalent sound level, the following formula is used:

[1] Ministry of Labour – Appendix B – Calculating Lex,8.

$$L_{ex,8} = 10\ \mathrm{Log}_{10}\left(\frac{\left[\sum_{i=1}^{n}(t_i \times 10^{0.1\,SPL_i})\right]}{8}\right)$$

Where:
$L_{ex,8}$ is the equivalent sound exposure level in 8 hours,
Σ is the sum of the values in the enclosed expression for all activities from i = 1 to i = n,
i is a discrete activity of a worker exposed to a sound level,
t_i is the duration in hours of I,
SPL_i is the sound level of i in dBA,
n is the total number of discrete activities in the worker's total workday.

The Office of Risk Management is equipped with a basic sound level meter and with a noise dosimeter. Both devices are equipped with pre-set calibrators and are briefly described below.

REED SL-4012 Sound Level Meter
This device is a single measurement, digital instrument used to obtain an instant reading of the sound level in the given area. It can also capture the minimum and maximum sound levels within a given time period. This device is used primarily for area samples.

Quest Noise-Pro DL Dosimeter
This device is intended to be worn by a worker during a pre-set time period (usually an entire shift) with the recording device positioned near the user's ear to capture the user's exposure to noise over the time period. The microphone captures the sound level and records it for the entire time period, after which the data can be downloaded and the results evaluated. The most useful function of this device is its ability to generate the user's time-weighted average for an exact time period.

Both devices are calibrated before and after conducting a basic assessment of the workplace or area in question. Each device is also laboratory calibrated annually.

ANATOMY OF THE EAR

There are three major parts of the ear: the outer, middle, and inner ear[2].

The **outer ear** collects sound vibrations and consists of the ear lobe, which directs sound toward the eardrum.

The **middle ear** transmits mechanical vibrations from the air into vibrations in fluid. The middle ear consists of the:

- Ossicle (which includes the incus, stapes, and malleus);
- Eustachian tube, which equalizes pressure between the middle and outer ear;
- Oval window; and
- Round window.

[2] Yates, David A. Safety Professional's Reference and Study Guide; 2nd edition; 272.

The **inner ear** changes mechanical waves in a liquid to chemical impulses sent to the brain. The inner ear consists of the cochlea and the organ of Corti, which is the essential receptor end organ for hearing, and contains the hair cells.

Auditory Health Effects

The main auditory effects include[3]:

- **Acoustic trauma –** sudden hearing damage caused by short burst of extremely loud noise, such as a gun shot.
- **Tinnitus –** ringing or buzzing in the ear.
- **Temporary hearing loss** – also known as temporary threshold shift (TTS), which occurs immediately after exposure to a high level of noise. There is gradual recovery when the affected person spends time in a quiet place. Complete recovery may take several hours or days (up to 48 hours).
- **Permanent hearing loss** – permanent hearing loss, also known as permanent threshold shift (PTS), usually progresses constantly as chronic noise exposure continues year after year. Most individuals do not notice the impairment at first. The hearing impairment is noticeable only when it is substantial enough to interfere with routine activities. At this stage, permanent and irreversible hearing damage has occurred. Noise-induced hearing damage cannot be cured by medical treatment and worsens as the noise exposure continues. When the noise exposure stops, the person does not regain the lost hearing sensitivity. As the employee ages, hearing may worsen as age-related hearing loss adds to the existing noise-induced hearing loss. Permanent hearing loss can also occur from a single traumatic event.

Types of Hearing Loss

There are different types of hearing loss, which are briefly listed below.[4]

- Conductive – occurring in the outer and middle ear; is the loss of "loudness".
- Sensorineural – occurs in the inner ear, where the hair cells are located.
- Mixed – occurs as a combination of both conductive and sensorineural.
- Central nervous system – occurs between the inner ear and the brain and may have causes unrelated to noise exposure.
- Psychogenic – occurs in the brain; may be the result of psychological trauma.

Major Causes of Hearing Loss

Cause of hearing loss may be related to:

- Obstruction or foreign body in the ear;
- Disease;
- Acoustic trauma (acute / chronic);
- Presbycusis (age-related hearing loss);
- Sociocusis (socially-related hearing loss);
- Noise-induced (acute / chronic).

[3] CCOHS – Noise – Auditory Effects – March 2019.
[4] Yates, David A. Safety Professional's Reference and Study Guide; 2nd edition; 272-273

Health Concerns

Workers who have health concerns, which they believe may be related to their work environment are encouraged to discuss their concerns with their supervisor. Any health effect(s) or symptom(s) related to employment (noise or otherwise) must be reported to the Health and Wellness Sector of Human Resources. Further assessment of the workplace may be required.

The table below, originally developed by the Canadian Centre for Occupational Health and Safety, gives an indication of how much noise is typical of a given environment.

Example Noise Levels	
Noise Source	**dB(A)**
Pneumatic chipper at 1 metre	115
Hand-held circular saw at 1 metre	115
Textile room	103
Newspaper press	95
Power lawn mower at 1 metre	92
Diesel truck 50 km/h at 20 metres	85
Passenger car 60 km/h at 20 metres	65
Conversation at 1 metre	55
Quiet room	40

CONTROL MEASURES

Regulation 381 requires that reasonable efforts be made to control noise propagation at its source. Elimination of noise to the extent feasible must be first explored before providing hearing protection to workers or students. Where elimination of noise is not feasible, further engineered controls (e.g. enclosures, mufflers, etc.) must be explored prior to the provision of hearing protection. In the event that engineered control measures are not available or practical – of if additional protection is required – hearing protection can be a reasonable hazard control method.

Hearing Protection Devices (HPDs)

As clearly indicated in Section 2(6), hearing protection devices are considered a last resort for worker protection. This is because HPDs do not remove the hazard; rather, they protect a single worker, if an ear insert (plug) or other HPD is worn correctly. HPDs come in a variety of shapes, styles, and types; however, at the University of Ottawa, most HPDs are the foam roll-down type – see the photo below.

Figure 1 - Example roll down hearing protection

These are commonly found, individually wrapped in areas across campus that have already been identified as "noisy", such as at the entrance to the Powerplant, entrances to workshops, etc. In most cases, they will be in a small box mounted on a wall or placed on a shelf. Should you notice that one of the boxes is empty, or that no HPDs are available to use at a given location, notify your supervisor or contact the Health, Safety and Risk Manager.

Please note that personal audio devices, such as iPods and MP3 players, are not considered suitable hearing protection.

Please consult CSA Z94.2-14 for more information and examples of hearing protection.

Training

Prior to a worker or user receiving and wearing a hearing protection device, a supervisor must provide this person with instructions on how to properly use and install the HPD. The supervisor must also explain the device's limitations and why the HPD is required in certain areas. Information about these devices is typically available from the manufacturer or on the supplier's website. A video illustrating how to fit foam earplugs is available on YouTube. Brief training presentations as well as a sample fitting aid are also available through the Office of Risk Management, upon request.

Once training on the use of HPDs has been provided to workers, a supervisor is required to document, in writing:

- the full name of person who took the training;
- the job title and associated activities (e.g. job description);
- the date of the training;
- the content of the training (i.e. what was covered and a short summary of discussions);
- the sampled noise values of the workplace;
- the worker's signature.

These requirements can easily be met by creating an attendance sheet and having each participant print out and sign their name (see Appendix 2 for a **Sample Attendance Sheet**).

For additional information on training requirements, sample presentations and other materials, please contact the Office of Risk Management.

SIGNAGE

As indicated in section 2(7) of Regulation 381, a clearly visible warning sign shall be posted at all approaches to an area where the sound level **regularly** exceeds 85 dB(A) (including research activities). Facilities have adopted the implementation of signage at 80 dB(A).

The University of Ottawa currently has a pre-defined template for these signs. Signs can be requested through Facilities (via ext. 2222). An example of the sign is in Appendix 1.

AUDIOGRAMS

An audiogram is a personal medical surveillance test that is strongly recommended for those who work in traditionally "noisy" areas or who may have cause to work in noisy areas as part of their normal duties (including research activities). These individuals may include, but are not limited to:

- mechanics
- plumbers
- power plant workers
- electricians
- architectural or construction tradespeople
- project managers
- animal care and veterinary service workers
- computing and communications service workers
- workshop technicians
- laboratory managers
- etc.

The purpose of the audiometric evaluation is to identify the potential progression of hearing loss so that preventive measures can be implemented, as well as to identify temporary hearing loss before it becomes permanent. An example tool provided by WSIB is available at http://www.toneitdown.ca.

Audiometric testing is conducted by a certified audiologist. Appointments are scheduled through the Health and Wellness Sector of Human Resources. Test results are confidential shared with the worker only. It is recommended that at-risk workers undergo an audiogram at the start of their employment at the university (i.e. within the first six (6) months), every two years thereafter, and again before leaving their employment at the University.

Supervisors are required to identify individuals who could be expected to regularly encounter excessive noise levels and to refer them, as necessary, to the Health and Wellness Sector for an audiogram.

BUILDING INVENTORY

As part of the hearing conservation program, the University of Ottawa conducted an audit of buildings on campus, focusing on larger buildings, such as Desmarais and University Centre, since their higher operational loads require larger (and consequently noisier) mechanical rooms. In contrast, noise levels in mechanical rooms in small houses on King Edward, Laurier,

Stewart, Séraphin-Marion etc. would not regularly reach or exceed 85 dB(A), therefore these areas were not included in the initial assessment.

Noise levels are not limited solely to physical environments such as mechanical rooms. Research and support workspaces also have the potential to reach hazardous noise levels. It is incumbent on the supervisor to identify the potential hazard, assess the risk, and institute proper controls to mitigate the hazard. Of particular note, while you may not be generating a hazardous noise level, other persons working in the area may be conducting work that produces the hazardous noise level – control measures may be required nonetheless.

A person may request a noise assessment of their work area at any time by contacting their supervisor or the Office of Risk Management at ext. 5892 or safety@uottawa.ca.

Appendix 3 lists the results of noise surveys conducted on campus.

DISCIPLINARY ACTION

Failure to implement the requirements in this program may result in disciplinary action in accordance with applicable collective agreements and/or University policies.

ADDITIONAL RESOURCES

Additional resources are available from the following organizations:

- WSIB – Noise Induced Hearing Loss

APPENDIX 1 – SIGNAGE

Exposition à des niveaux de bruits dangereux ; protection auditive requise

Exposure to hazardous sound levels, hearing protection is required

APPENDIX 2 – SAMPLE ATTENDANCE SHEET

Session title:										
Session date:										
SURNAME	**GIVEN NAME**	**EMAIL**	**INITIALS**	**STATUS**	**ID #**	**FACULTY SERVICE**	**DEPARTMENT**	**SUPERVISOR**	**PHONE**	**BUILDING/ROOM**

Material Covered:

_____
_____
_____
_____
_____
_____
_____

Attachments:

APPENDIX 3 – NOISE ASSESSED AREAS

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
1 Stewart	120 (loading dock)	28-May-10	58.4	76.9	not required
100 Laurier	0010 (mechanical room)	3-Jun-16	71.4	83.1	Installed 6-Jun-16
	011 (under sculpture lab)	25-Jun-10	54.3	74.5	not required
	011 (sculpture exhaust)	31-Mar-15	N/A	75	not required
	03 (welding precipitator)	31-Mar-15	N/A	78	not required
	100 (SawStop table saw)	31-Mar-15	75	96	Installed
	100 (disc sander)	31-Mar-15	78	93	Installed
	100 (drill press)	31-Mar-15	67	70	Installed
	100 (disc sander 2)	31-Mar-15	79	81	Installed
	100 (chop saw)	31-Mar-15	87	92	Installed
	100 (planer)	31-Mar-15	N/A	92	Installed
	100 (panel saw)	31-Mar-15	N/A	95	Installed
	100 (chop saw 2)	31-Mar-15	N/A	94	Installed
141 Louis-Pasteur	Power plant; bottom of main stairs	19-Mar-10	82.4	84.2	Installed
	Power plant; near blue condenser	19-Mar-10	88.8	91.7	Installed
	Tunnels; between DRO / BIO	19-Mar-10	50.8	68.9	not required
	118A – Plumbing Workshop	31-Mar-15	N/A	110	Installed 31-Mar-15
200 Lees	A-block; mechanical room	21-Apr-10	62.3	96.5	Installed
	C100D	11-Jun-10	60.3	71.7	not required
	B151	11-Jun-10	68.1	73.7	not required
	B150	11-Jun-10	70	85.4	Installed 15-Sep-10
	E056	11-Jun-10	71.3	77.7	not required
	E253	11-Jun-10	73	81.5	Installed 15-Sep-10
	D201	21-Feb-14	62.1	70.2	not required
Academic Hall	013	25-Jun-10	65.8	75.4	not required
	015 (radial arm saw)	31-Mar-15	82	98	Installed

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	015 (chop saw)	31-Mar-15	96	99	signage provided
	015 (table saw)	31-Mar-15	83	87	signage provided
110 University	119	25-Jun-10	75.9	82.9	Installed 29-Sep-10
ARTS (70 LRR)	066 (off of underground parking)	28-May-10	69.5	74.8	not required
	511 (5th floor)	10-Dec-13	73.7	88.0	Installed 12-Dec-13
Bioscience	Mechanical room; off tunnels	19-Mar-10	69.3	77.3	not required
	008	11-Nov-13	68.1	81.6	Installed
Brooks	004 / 006	10-Dec-13	77.8	82.6	Installed
Colonel By	B602	19-Jul-10	64.5	79.5	not required
	D502	19-Jul-10	72.5	79.9	not required
	D502 Generator Room	19-Jul-10	Installed		
	B013	19-Jul-10	72.3	80.5	Installed 15-Sep-10
	D302	15-Jun-15	70.4	84.0	Installed
	D116A	15-Jun-15	60.5	88.1	Installed
	E03	15-Jun-15	75	115	Installed
	D415	8-Apr-15	60.8	69.4	not required
	E012	17-Apr-15	-	87	Installed
Desmarais	5020 (mechanical room)	28-May-10	63.6	78.5	not required
	13020 (mechanical room)	28-May-10	67	96.1	Installed 29-Sep-10
	13010 (mechanical room)	28-May-10	45.1	67.4	not required
	13030 (mechanical room)	28-May-10	Installed		
	13040 (mechanical room)	28-May-10	63.2	76.2	not required
D'Iorio	Mechanical room; off tunnels	19-Mar-10	75.6	89.2	Installed
	502 – rooftop generator – BIO & DRO	04-Nov-10	Installed		
	503B – rooftop generator – DRO	04-Nov-10	Installed		
Fauteux	142	19-Jul-10	59.9	69.4	not required
	142A	19-Jul-10	65.5	68.5	not required
Friel	P207	16-Jan-15	67.4	68.8	not required

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
FSS	Penthouse (16th)	24-Jun-13	47.0	76.2	Installed
	0015	24-Jun-13	75.0	90.9	Installed 24-Jun-13
	0110	24-Jun-13	59.0	74.8	not required
	0111	24-Jun-13	55.4	69.8	not required
	0101A	24-Jun-13	62.6	67.2	not required
	0102	24-Jun-13	59.9	64.2	not required
	0104	24-Jun-13	50.3	52.3	not required
	0106	24-Jun-13	57.1	66.8	not required
	0105	24-Jun-13	52.0	73.4	not required
Gendron	468	24-Jun-13	62.3	67.5	not required
	505	24-Jun-13	63.7	70.1	not required
	528	24-Jun-13	62.5	69.3	not required
	529	24-Jun-13	61.4	63.8	not required
	530	24-Jun-13	57.9	64.2	not required
Hagen	106B	25-Jun-10	50.6	58.6	not required
	308B	25-Jun-10	69.9	71.8	not required
Henderson Residence	001	12-Feb-16	62.6	70.3	not required
	003	12-Feb-16	58.6	61.7	not required
Hyman Soloway	01	10-Dec-13	73.1	79.7	not required
	010	10-Dec-13	71.1	79.4	not required
Lamoureux	Mechanical room; off tunnels	21-Apr-10	77.5	86.5	Installed 4-Nov-10
	Mechanical room; off tunnels	21-Apr-10	79.3	83.6	Installed 4-Nov-10
Learning Crossroads	011	19-Oct-18	N/A	63	not required
	011A	19-Oct-18	N/A	61	not required
	011B	19-Oct-18	N/A	65	not required
	C043	19-Oct-18	N/A	70	not required
	101	19-Oct-18	N/A	62	not required
	101A	19-Oct-18	N/A	65	not required

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	132	19-Oct-18	N/A	45	not required
	132A	19-Oct-18	N/A	54	not required
	202	19-Oct-18	N/A	45	not required
	202A	19-Oct-18	N/A	45	not required
	232	19-Oct-18	N/A	45	not required
	232A	19-Oct-18	N/A	52	not required
	302	19-Oct-18	N/A	54	not required
	302A	19-Oct-18	N/A	45	not required
	331	19-Oct-18	N/A	45	not required
	331A	19-Oct-18	N/A	45	not required
	402	19-Oct-18	N/A	45	not required
	402A	19-Oct-18	N/A	45	not required
	431	19-Oct-18	N/A	62	not required
	431A	19-Oct-18	N/A	64	not required
	502	19-Oct-18	N/A	45	not required
	502A	19-Oct-18	N/A	45	not required
	531	19-Oct-18	N/A	45	not required
	531A	19-Oct-18	N/A	45	not required
Marie-Curie	005	14-Nov-13	72.0	84.0	Installed
	008	14-Nov-13	75.1	78.5	Installed
Marchand	1600	10-Dec-13	69.1	74.7	not required
	08A	10-Dec-13	71.9	77.0	not required
	08B	10-Dec-13	79.3	80.5	Installed 10-Dec-13
Marion	Rooftop mechanical room	19-Jul-10	74.2	77.8	not required
	105	19-Jul-10	67.7	75.6	not required
	005	19-Jul-10	64.1	70.3	not required
Montpetit	Room 0010; off tunnels	19-Mar-10	76.2	85.5	Installed 4-Nov-10
	200C (east)	23-Jul-13	73.9	95.8	Installed 23-Jul-13

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	200D (west)	23-Jul-13	72.9	89.7	Installed 23-Jul-13
Morisset	624 (rooftop mechanical room)	19-Jul-10	64	76.4	not required
Perez	010 (off of underground parking)	28-May-10	72.9	79.8	not required
Residential Complex	Penthouse (Floor 21)	10-Dec-13	62.3	72.6	not required
	R709A	10-Dec-13	74.4	64.8	not required
	R008/R009/R010	10-Dec-13	69.4	79.6	not required
Rideau	1903	12-Feb-16	64.8	67.9	not required
	1901	12-Feb-16	60.7	67.8	not required
Roger Guindon	RGN 1138 (vacuum pump)	21-Apr-10	82.5	88.2	Installed 13-Sep-10
	RGN 1138 (reverse osmosis tank)	21-Apr-10	82.2	86.8	Installed 13-Sep-10
	RGN 1138 (domestic water booster)	21-Apr-10	81.5	90.1	Installed 13-Sep-10
	RGN 1327 C (MRI equipment)	24-Apr-12	See Report 27-Apr-2012 - no human hazard		
	RGN 3003A	21-Apr-10	79.8	84.9	Installed
	RGN 3003A	21-Apr-10	78.5	79.9	Installed
	RGN 5002 (penthouse)	21-Apr-10	77.8	81.2	Installed 13-Sep-10
	RGN 5004 (penthouse)	21-Apr-10	78.6	87	Installed 13-Sep-10
	RGN 1327C	24-Apr-12	43	72.5	not required
	RGN 1317	4-Jul-17	-	63.5	not required
	RGN 1451	21-May-15	-	76	not required
	RGN 1521	6-Dec-16	58	71	not required
Simard	511	25-Jun-10	64.6	76.1	not required
	East Rooftop mechanical room	25-Jun-10	62.2	78.3	not required
SITE	SITE 0135	21-Jun-10	80.4	86.8	Installed 15-Sep-10
	SITE 0107	21-Jun-10	77.9	86.9	Installed 15-Sep-10
	SITE 0005 (generator room)	21-Jun-10	Installed		
	SITE 0004	21-Jun-10	66	80.6	Installed 15-Sep-10
	SITE chill water tunnel	21-Jun-10	54.4	70.6	not required
	SITE 1003A	4-Apr-18	-	70.0	not required

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	SITE 1024E	4-Apr-18	-	< 50	not required
Sports Complex	C107A	21-Apr-10	85.2	88.7	Installed 15-Sep-10
	C105A	21-Apr-10	79.9	85.8	Installed 15-Sep-10
	C105A	21-Apr-10	89.3	93.3	Installed 15-Sep-10
Stanton	P3 (17th Floor)	10-Dec-13	66.8	79.0	not required
	04	10-Dec-13	71.5	79.3	not required
	06	10-Dec-13	69.4	75.4	not required
	08	10-Dec-13	63.1	66.4	not required
STEM	00W	19-Oct-18	N/A	59	not required
	0040	19-Oct-18	N/A	53	not required
	0041	19-Oct-18	N/A	56	not required
	0042	19-Oct-18	N/A	80	Installed
	0043	19-Oct-18	N/A	77	not required
	0044A	19-Oct-18	N/A	62	not required
	0W	19-Oct-18	N/A	68	not required
	024	20-Nov-18	76	93	Installed
	040	19-Oct-18	N/A	81	Installed
	033	19-Oct-18	N/A	75	not required
	035	19-Oct-18	N/A	58	not required
	040	19-Oct-18	N/A	72	not required
	020G	19-Oct-18	N/A	68	not required
	100W	19-Oct-18	N/A	52	not required
	113A	19-Oct-18	N/A	43	not required
	118	19-Oct-18	N/A	67	not required
	200W	19-Oct-18	N/A	62	not required
	209	19-Oct-18	N/A	58	not required
	300W	19-Oct-18	N/A	60	not required
	374	19-Oct-18	N/A	60	not required

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	400	19-Oct-18	N/A	64	not required
	474	19-Oct-18	N/A	69	not required
	500W	19-Oct-18	N/A	64	not required
	559	19-Oct-18	N/A	64	not required
	600W	19-Oct-18	N/A	69	not required
	659	19-Oct-18	N/A	50	not required
	701 (entry)	19-Oct-18	N/A	66	not required
	720 (elevator)	19-Oct-18	N/A	65	not required
	701 (SW corner)	19-Oct-18	N/A	72	not required
	707	19-Oct-18	N/A	84	Installed
	701 (SE corner)	19-Oct-18	N/A	74	not required
	701 (stairway B)	19-Oct-18	N/A	79	not required
	701 (east side)	19-Oct-18	N/A	82	Installed
	706	19-Oct-18	N/A	69	not required
	701 (NE corner)	19-Oct-18	N/A	74	not required
Tabaret	139A	04-Jun-10	72.7	83.3	Installed 29-Sep-10
	322A	04-Jun-10	72.9	85.6	Installed 29-Sep-10
	W329	04-Jun-10	69.2	80.1	Installed 29-Sep-10
	C301	04-Jun-10	77.2	83.6	Installed 29-Sep-10
	236A	04-Jun-10	79.2	85.2	Installed 29-Sep-10
	110	04-Jun-10	69.3	75.4	not required
	152	04-Jun-10	77.7	80.9	Installed 29-Sep-10
	01D	04-Jun-10	72.6	80.3	Installed 29-Sep-10
	L064	04-Jun-10	76.6	87.5	Installed 29-Sep-10
	0039	04-Jun-10	74.3	81.5	Installed 29-Sep-10
	C03A	04-Jun-10	69.8	74.9	not required
	C018	30-Jul-13	57.3	75.6	not required
	045	30-Jul-13	68.2	78.8	not required

Building	Location Assessed	Date Assessed	Minimum	Maximum	Signage
	TBT generator room (tunnels)	04-Jun-10			Installed
Thompson	127/224 (same room)	10-Dec-13	77.0	83.7	Installed 12-Dec-13
University Centre	Across from kitchen (tunnels)	19-Mar-10	74.4	76.8	not required
	Room 0031; (tunnels)	19-Mar-10	68.8	78.1	not required
	Room 0031A;	12-Dec-13	80.1	84.3	Installed 12-Dec-13
	006 - Community Life Workshop	31-Mar-15	85	104	Installed
Vanier	0140	24-Jun-13	45.9	61.2	not required
	0189	24-Jun-13	53.8	64.9	not required
	3066 (penthouse)	24-Jun-13	74.4	86.8	Installed 24-Jun-13
	4079	10-Dec-13	66.3	68.1	not required
	5022	10-Dec-13	73.8	74.7	not required
	6028	24-Jun-13	57.4	74.8	not required