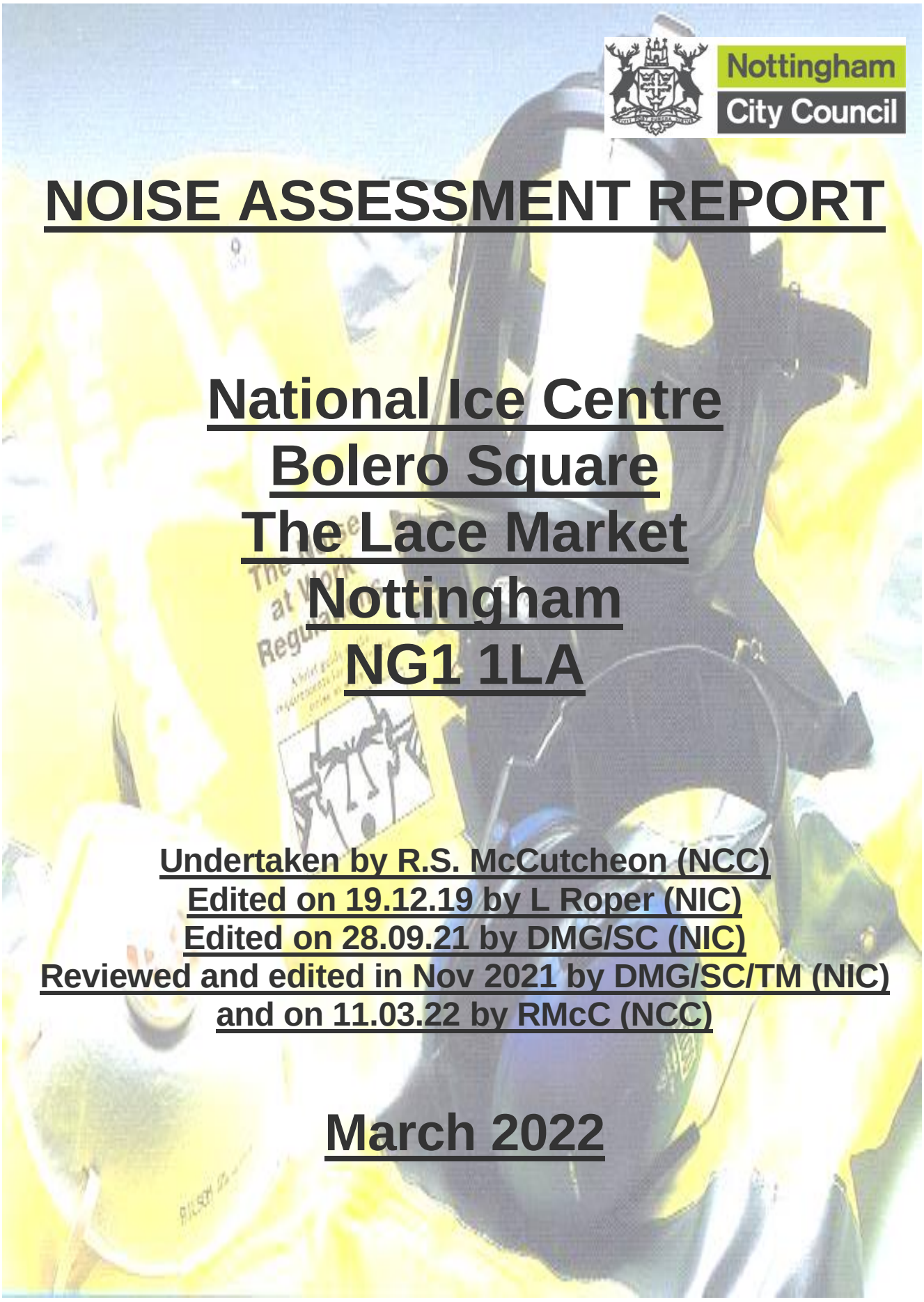

NOISE ASSESSMENT REPORT

National Ice Centre
Bolero Square
The Lace Market
Nottingham
NG1 1LA

Undertaken by R.S. McCutcheon (NCC)
Edited on 19.12.19 by L Roper (NIC)
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Reviewed and edited in Nov 2021 by DMG/SC/TM (NIC)
and on 11.03.22 by RMcC (NCC)

March 2022

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SUMMARY

This complete reassessment of the noise producing activities that are currently occurring within the National Ice Arena and is in place to ensure compliance with and understanding of the main requirements of the Control of Noise at Work Regulations 2005

In assessing the activities and noise sources within these premises, it must be appreciated that due to the nature of operation there is no standard work patterns within the working environment and therefore, the exact exposure levels will be difficult to identify.

Therefore to simplify this assessment process and to ensure that any injurious noise levels are considered, the key staff around the entire site who may be exposed to a variety of different noise levels and even background noise levels within the general locations should be considered as being at potential noise induced hearing risks based on the activity being undertaken at that particular time.

With this as the noise situation in place within the workplace, it is more sensible to approach the primary noise sources that are present within the centre and identifying the potential exposure levels that staff may encounter for certain activities.

This assessment will also look to assist the management of the National Ice Centre to understand how noise levels are measured in a simple way which will allow the management to then consider what levels of noise, individuals may encounter.

An outline of legal obligations is given later in this report.

Equipment used

PULSAR Model 84
Serial No. 113257

Battery Check	-	O.k
Calibration Check	-	O.k

INTRODUCTION

This assessment follows on from previous assessments of noise but this one will look at the overall noise issue and how it should be effectively managed on site.

The National Ice Centre can be considered as operating in 3 distinct ways when breaking down the issue of noise.

These 3 operations are:

- The skating operation which includes noise from music, general background noise and ice cutting activities
- General maintenance activities and building operational noise including the grinding of skates or the noise produced within the plant room
- The National Ice Centre operating as a music / concert event venue

There are a number of staff operating on different hours and working different areas within the site who may each experience differing levels of noise exposure.

It should be noted that the most significant noise sources within the premises occur within the Ice Plant room, Olympic Rink during a disco session and in the arena when an event is occurring

The Ice Plant room is a large concrete floored, brick walled environment with ice plant operating. This environment is designed such that the reverberant noise will expose any worker in this environment to noise around the 90 dB(A) levels

The Olympic Rink playing amplified music generates noise levels at 90 dB(A)

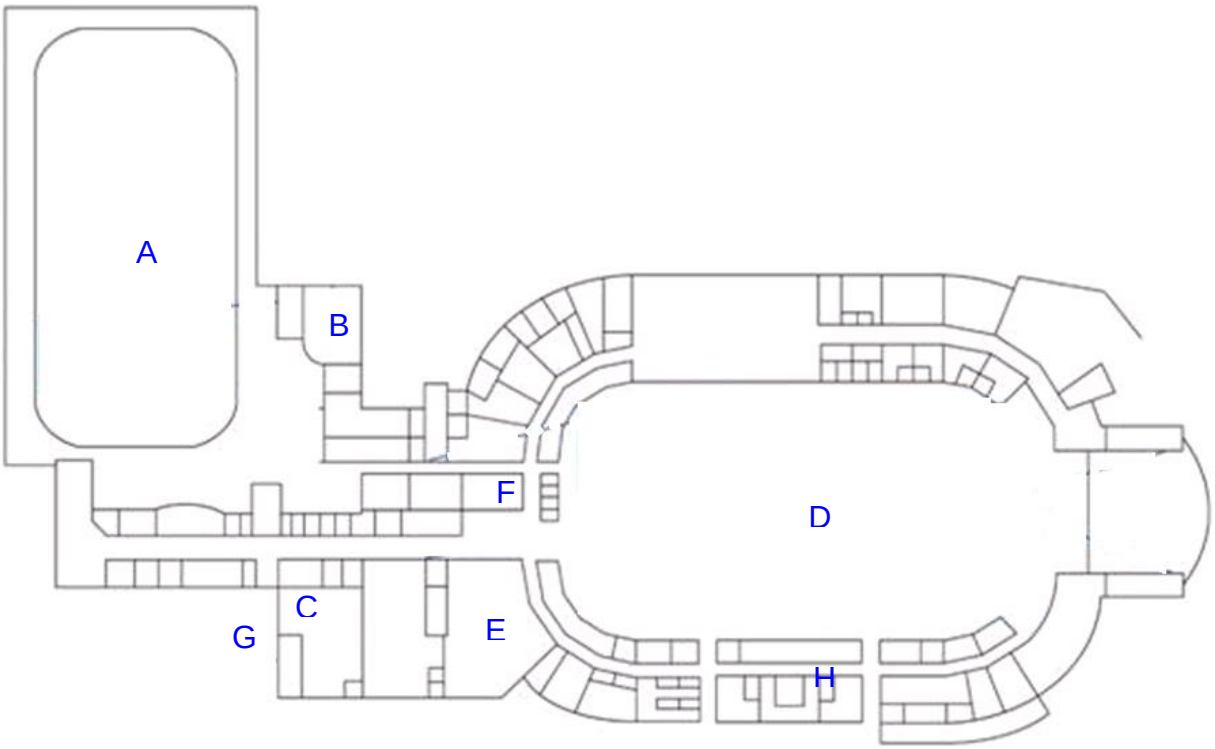
The Arena bowl during an event can achieve levels around 100 dB(A) although this will be dependent on the nature and type of event that is occurring within the arena

For simplicity, all staff who work within the arena will be identified as working an 8hr shift pattern however, there will be times that workers within the arena may work a longer or shorter shift pattern.

To assist in the general approach to noise management within the National Ice Centre, where applicable, we will show how the different shift patterns will impact on the noise exposure to workers and how that can then be related to the 8hr shift pattern

All recommendations and readings are done on the basis of this working pattern

FLOOR PLANS AND READING LOCATIONS



A	Olympic Rink
B	Boot Change / Skate Hire
C	Level 2 Grinding Room
D	Arena Bowl
E	Ice Plant Room
F	Concourse
G	Loading Bay
H	Level 1

Photos of National Ice Centre showing the activity and location

Olympic Ice Rink (A)

Public Disco Session

Average exposure length (up to 1 hour)

NIC Departments working in this location during public disco session

- Facilities and ice sports staff
- Coaches
- Managers on Duty

Skate Hire / Boot Change (B)

Public Disco Session

Average exposure length (up to 1 hour)

NIC Departments working in this location during public disco session

- Facilities and ice sports staff
- Coaches
- Managers on Duty

Olympic Ice Rink (A)

Standard Public Skating Session

Average exposure length (up to 1 hour)

NIC Departments working in this location during public skating session

- Facilities and ice sports staff
- Coaches
- Managers on Duty

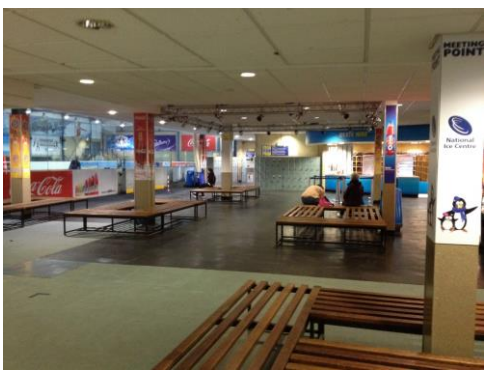
Skate Hire / Boot Change (B)

Standard Public Skating Session

Average exposure length (up to 2 hours)

NIC Departments working in this location during public skating session

- Facilities and ice sports staff
- Coaches
- Managers on Duty



Skate Hire (B)

Grinding Skates using the Pro Sharp Skate Grinder

Average exposure length (up to 2 hours) followed by a minimum 15 minute break

NIC Departments working in this location during public skating session

- Facilities and ice sports staff
- Managers on Duty

Use of the Zamboni (A / D)

Resurfacing the Ice

Average exposure length (15 Minutes is the normal time it takes to cut the ice)

NIC Departments working in this location during and Ice Cut

- Ice Technicians
- Facilities and ice sports staff
- Managers on Duty
- Security Officers
- Facilities Supervisors

Use of the Ice Edger (A / D)

Resurfacing the Ice

Average exposure length (5 Minutes is the normal time it takes to edge the ice)

NIC Departments working in this location during and Ice Cut

- Ice Technicians

Ice Plant Room (E)

General Maintenance and monitoring

Average exposure length (15 Minutes)
Should the work take longer than15 mins, the plant is turned off for the duration of the work

NIC Departments working in this location

- Ice Technicians

Cooling Tower Entrance

General Maintenance and monitoring

Average exposure length within this location (15 Minutes)

NIC Departments working in this location

- Ice Technicians

Cooling Tower

General Maintenance and monitoring

Average exposure length within this location (15 Minutes)

NIC Departments working in this location

- Ice Technicians

Loading Bay (G)

Operating the Compactor

Average exposure length within this location (up to 20 Minutes)

NIC Departments working in this location

- Facilities

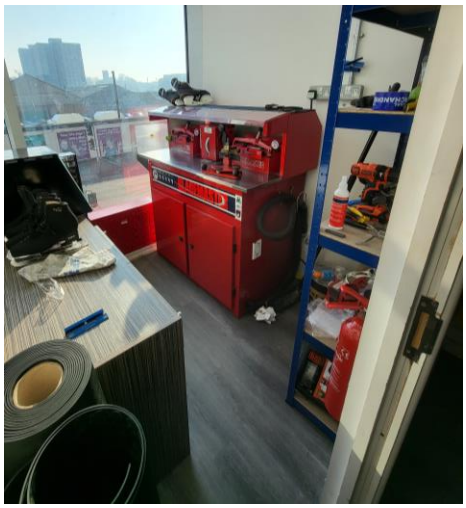
Loading Bay (G)

Operating the Bailing Machine

Average exposure length within this location (up to 20 Minutes)

NIC Departments working in this location

- Facilities



Level 2 Grinding Room (C)

Use of the Blade Master & Pro Sharp Skate Grinding Machine

Average exposure length within this location (between 5 minutes to a full 8 hr shift)

NIC Departments working in this location

- Ice Locker Staff

General Concourse (F)

Use of the Wet Rock

Average use (between 5 - 20 minutes)

NIC Departments working in this location

- Facilities

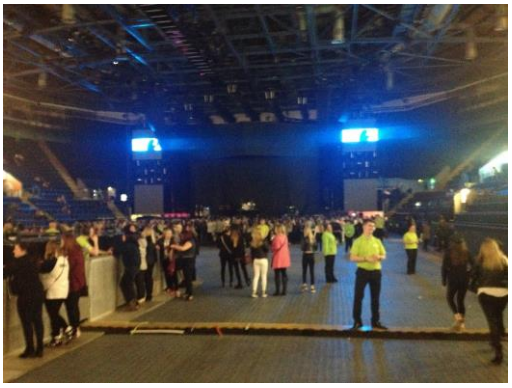
Level 2 Concourse (F)

General noise produced by the public attending an event

Average exposure length within this location (Events can last up to 5 hours)

NIC Departments working in this location

- All Departments



Arena Bowl (D)

Ingress / Egress
Amplified music within the arena

Average exposure length within this location (Events average at 3 hours of amplified music)

NIC Departments working in this location

- All Departments

RESULTS

For simplicity all readings having been rounded up to the to the nearest whole dB

ID	*Location / Activity Information*	*Leq dB(A)*	*Lpk dB(C)*
A	Public Disco Session (On Ice)	91	118
B	Public Disco Session (Skate Hire)	80	114
A	Standard Skating Session (On Ice)	79	104
B	Standard Skating Session (Skate Hire)	64	103
B	Use of the Pro Sharp Skate Grinder (Skate Hire)	83	112
C	Use of the Blade Master and Pro Sharp Skate Grinding Machine (Grinding Room)	82	118
A/D	Using the Zamboni	87	119
A/D	Use of the Ice Edger	99	128
E	Working within the Plant Room		
	(2 Compressors – 50% normal Operating mode)	83	112
	(1 Compressors – full load)	85	112
	(2 Compressors – full load)	87	112
	(3 Compressors – full load)	91	112
	Cooling Tower Entrance	86	128
	Cooling Tower	85	130
G	Use of the Compactor	73	107
G	Use of the Bailing Machine	80	115
F	Use of the Wet Rock	81	105
F	Concourse (During Ingress / Egress)	77	104
	Concourse (Event in progress)	77	114
D	Arena – Ingress / Egress	80	110
	Arena – Event in progress	100	131

H	Cellars Level 1 corridors	72	102
H	Sub Station 1 – Level 1 corridor	70	106
H	Heat Plant Room	74	111

Leq and $L_{EP,d}$

The previous page identifies the various areas of the building and activities which are considered as the most significant producers of noise within the National ice Centre

These levels are given as an Leq which means that this is the mean noise level to which an employee is exposed to during a typical cycle of work or operation.

Each of these reading is considered in isolation and is the levels in the absence of other significant noise sources in the environment.

The peak readings show the loudest reading taken during the short bursts of loud noise

The basis of all noise surveys is not however the Leq, but the actual exposure that a person may be exposed to during their working day.

This will be difficult to identify due to the diverse nature of work, events and other factors that means a typical noise exposure is not feasible to work out.

However if a person was exposed to the same noise for an 8 hour shift, the $L_{EP,d}$, or Daily Personal Exposure Level, would be equal to the Leq. As this does not happen, within the National Ice Centre, the Leq readings will be used to identify presumptive levels of Noise exposure and this can then be used as the basis for implementing effective controls for hearing protection within the building

The Leq, therefore will give an *indication* of potential $L_{EP,d}$.

- ***Employees do not work at a regular working pattern or use equipment or enter specific environments in a prescribed way for a specific length of time.***

Due to the high levels of potential reverberant noise (caused by the solid walls, floors and ceilings) that is located within this environment, in general terms the noise reduction relative to distance is identified below

Relative levels of noise contributions

Distance from source (m)	1	2	4	8	16	24
Relative level dB(A)	0	-6	-9	-12	-14	-16

LEP,d SUMMARY

For any LEP,d Graphs the following colours will indicate the potential noise exposure

	At or above Upper Action level
	Lower Action level
	Below Lower Action level

Olympic Rink
The noise levels in this area will range from 91dB(A) for a disco session through to 78 dB(A) for a public skating session.

If the disco session was on for 1 hour at 91 dB(A), the actual LEP,d for that person would be 82dB(A) and therefore still above the lower action level but below the upper action level.

Disco Public Skating Session (LEP,d)

Time	8 Hours	4 hours	2 hours	1 hour	30 minutes
LEP,d	91	88	85	82	79

Because of the significant difference between the levels of noise for the disco session and general skating, the public skating reading of 78 dB(A) would have a negligible impact on the LEP,d for that worker which works the disco session would be at 87dB(A)

However, with the general skating noise levels at 78dB(A), the LEP,d would not reach the lower action level of 80 dB(A)

Skate Hire – Disco Session and Public Skating
As with the noise readings in the general skating, the noise levels are below the lower action level within the boot change and skate hire location and therefore, even working for a full 8 hours in the environment, the noise would not exceed the lower action level.

Skate Sharpening
The use of the pro sharp skate grinders within the building can produce an Leq of 82dB(A) when used in conjunction with the local ventilation.

This level just above the lower action level of 80 dB(A) and unless the equipment was in use for the full 8 hour shift, is not likely to produce an LEP,d above the Lower action level but would be seen as a contributor to overall noise exposure for people using this equipment

Use of the Zamboni
The Zamboni used for the resurfacing of ice takes approximately 15 minutes per cut with an Leq of 86 dB(A)

With this figure it is possible to work out the noise exposure for staff depending on the number of time the zamboni is used during a shift.

Use of the Zamboni (LEP,d)

No of resurfaces	1	2	3	4	5	6	7	8	9	10
LEP,d	69	72	74	75	76	77	78	78	78	79

The LEP,d for 10 cuts in a shift is just below the lower action level but it is likely that any other noise related activity done in a shift would be liable and likely to take that person's noise exposure above the lower action level

Use of the Ice Edger

Due to the high levels of noise produced by the Ice Edge, Its operation and use must be considered as requiring hearing protection.

The Ice Edger is an item of work equipment that produces a significant noise level at 99 dB(A) and could contribute significantly to any staff's noise exposure.

The average edge can take between 5 and 7 minutes to complete and the normal number of edges cut it would be used by a person on a shift is 2.

For information, the table below within this report considers how the noise exposure levels increase in line with the usage going from a single use up to 5 operations in a shift.

For ease, it will be assumed that a single ice edging operation will take 7 minutes to complete.

Use of the Ice Edger (LEP,d)

No of Edges Cut	1	2	3	4	5
LEP,d	82	85	88	88	88

Using these figures, it becomes apparent that the LEP,d for the use of the ice edge, ever for one use will be above the lower action level. A further use of the ice edger will take it into the upper action level.

Plant Room

Must be considered as a 'Hearing Protection' zone

The Plant Room is a significant producer of noise with a normal operating level of 83 dB(A) when in its 2 compressor 50% mode.

This level will change if the load increases or if additional compressors are running with the highest reading likely to occur when the plan is in operating mode for a Panthers match.

The length of time that people spend within this environment is strictly controlled and monitored and in the event of activities requiring long periods of time within this environment, the compressors would be turned off, significantly reducing the noise levels within this environment.

It is normal practice that a person working in this environment would only be in for 15 minutes. At 15 minutes the LEP,d for working within this area would be less than 70dB(A).

The lower action level in the normal operating mode will be achieved after 4 hours on work within the plant room.

With all compressors running, such as potentially during a Panthers match, the lower action level is reached after 30 minutes.

Roof Area

Could be considered as a 'Hearing Protection' zone

These areas may be accessed by the ice technicians for maintenance activities.

Both the entrance to the cooling tower and the cooling tower itself produce noise levels of approximately 86 dB(A) which is above the upper action level.

However the exposure time within this area is limited and is unlikely to exceed 15 minutes duration in any shift and therefore the L_{EP},d is going to be 71dB(A) and even at 30minutes, the L_{EP},d would still only be 74 dB(A).

Loading Bay

The Compactor produces a noise level of 73 dB(A) and its operation is not going to produce or contribute to a workers noise exposure and the L_{EP},d whilst using this equipment will only reach 73 dB(A) if it was in operation for a full 8 hours and if it was used for 15 minutes, the L_{EP},d would be less than 60 dB(A).

The Bailing Machine does produce 80 dB(A) but for the purposes of L_{EP},d , this would only occur if it was in operation for the full 8 hours. The normal operation of this equipment lasts between 15 and 20 minutes. This period of time reduces the L_{EP},d for the use of the compactor to 65 dB(A).

Use of the Wet Rock

As with the use of the bailing machine which produce a similar level of noise the wet rock machine produces a noise level above the lower action level if it was in use for a full 8 hours.

However the actual operation of this equipment limits its use to around 15 minutes and as such, the L_{EP},d for this equipment is around 66 dB(A).

Arena

Must be considered as a 'Hearing Protection' 

The use of the National Ice Centre as an event venue does create the potential for significant noise levels and must be considered as the principal noise source within the National Ice Centre.

Ingress / Egress

During ingress / egress the general background noise was recorded at 80 dB(A). This can be a mix of ambient background music but is primarily composed of the public talking between themselves.

The ingress and egress can occur over a period of an hours and therefore the L_{EP},d for the ingress and egress will be about 71 dB(A).

Staff working within the arena during the ingress and egress will not be wearing hearing protection if amplified music is not being played because their role at this time is to provide direction and support to the public entering the venue.

Event in progress

Every event will produce slightly different noise levels depending on the type and style of event, the configuration of speakers and other factors.

There is an existing monitoring system in place that records noise levels of individual events.

This assessment is concerned with the potential noise exposure to staff within the venue as each concert will produce a different noise footprint.

The level of noise from the floor was recorded as being 100 dB(A) and this was not identified as being an unusual event in respect of how loud / quiet it was.

It should be also be noted that the general design of the arena is in such to minimise the escape of noise to the outside of the arena and mitigate sound distortion and is a bowl design which is in place with reflective surfaces that do not absorb sound.

Irrespective of where you are located within the arena during an event, the noise levels will be deemed as significant and will be based on the general figure of 100 dB(A) however proximity to the line of sight of speaker may also increase the level.

The overall L_{EP},d will vary depend on the Concert Duration and this is highlighted by the following table that identifies the duration of the concert and the potential L_{EP},d noise exposure.

Concert Duration	8 Hours	4 hours	2 hours	1 hour	30 mins
L_{EP},d	100	97	94	91	88

It can be identified that with a noise level of 100 d(B), even if the music is only being played for 30 minutes, the L_{EP},d for any staff in that location would still be above the upper action level.

The L_{EP},d for a worker will reach the upper action level with noise being produced at 100 dB(A) after 15 minutes and the lower action level only takes 5 minutes to achieve.

It is therefore important that any person who enters the arena whilst amplified music is being is being played wears the required hearing protection and all entry points to this location are identified as requiring hearing protection.

Concourse

During an event, significant numbers of the public enter the visit and will congregate around the foyer and concourse areas.

The general levels of noise in this area will vary slightly dependent on the public in attendance and their behaviours however readings taken show that the noise levels approach 77 dB(A) both during ingress / egress and also during the event.

This figure is less than the lower action level and it is likely that the average concert will not last a full 8 hours so the L_{EP},d is likely to be less than 77 dB(A)**.**

NOISE REDUCTION AND RECOMENDATIONS

Under the Control of Noise at Work Regulations there is a legal obligation to reduce the noise exposure levels of employees whenever reasonably practicable to the lowest levels.

Within the National Ice Centre, there are some loud pieces of equipment, working environments and activities that present the potential for significant noise.

This is coupled by other activities and process that have some noise exposure but at lower levels and this makes specific noise exposure for an individual difficult to identify.

Reverberant Noise

The construction of the National Ice Centre is a mix of hard and flat surfaces that are highly reflective to noise.

Replacing existing surfaces with different materials with a higher sound absorption coefficient is not practical and would be both expensive and not reduce the overall exposure of staff to noise significantly.

It should be noted that such measures will reduce the noise exposures of employees distant from the noise sources but will not reduce the noise exposures of those undertaking the task directly.

Olympic Rink

The noise levels being produced during the disco session is such that a 1 hour session is going to take the noise exposure above the Lower Action level and a 2 hour session will take the noise exposure to above the upper action level.

Any staff working on the ice during a disco session must be provided with suitable hearing protection and it will need to be worn during the periods of time that the music is being played.

Ice Maintenance

The resurfacing and edging are both activities the produce noise exposure.

The levels of noise produced whilst working on the Zamboni are below the action levels and 10 cuts would be seen as producing an exposure below the lower action level, however as this is not the only activity that ice maintenance workers are going to complete that has a noise impact.

I would recommend that the use of the Zamboni is revisited with all staff that use it and a suitable hearing protection regime is implemented for its use and that any use of the Zamboni is done with workers using hearing protection.

Due to the levels of noise that the Ice Edge produces, this equipment must be used only in conjunction with the wearing of suitable hearing protection. As identified, a single use will be at a level above the Lower Action Level and a second use will take the noise exposure above the Upper Action Level.

Hearing protection must be made mandatory for all staff that use this equipment.

Plant Room

The plant room is a significant noise source within the National Ice Centre and depending on the number of compressors and loading, it is possible that 30 minutes within this environment may produce an $L_{EP,d}$ of 80 dB(A) however, with the introduction on the new plant during 2020, the ability to control the compressors and the more effective operation

of the plant has reduced the potential noise and it is more likely that an $L_{EP,d}$ of 80 will be achieved after 4 hours of continual work within the plant room .

It is therefore important that all staff that enter this area are required to wear appropriate hearing protection and that this is identified as a mandatory hearing protection zone within the National Ice Centre.

Roof Area

The Roof area includes the cooling tower and other noise producing sources.

The levels of noise are just above the Upper Action Level but due to the nature and inaccessibility of this location, it would be sensible that this location is looked at with regard to the work and reasons for being in this area.

A management decision can then be undertaken to consider if it is reasonable to identify this area as a hearing protection zone.

If this is becomes the agreed practice, staff in this area will need to wear hearing protection whilst working around this location

Arena

The arena is the primary noise source within this environment and has the largest impact on exposure levels to the broadest levels of staffing across the site.

As identified within the $L_{EP,d}$ for a concert, even being in the environment for 30 minutes will still be above the upper action level.

The lower action level of noise exposure is reached after 5 minutes and the upper action level is reached after 15 minutes.

Due to this short period of exposure, all staff who enter this area whilst working on or behalf of the venue must be required to wear hearing protection and that hearing protection needs to have an effective noise reduction level of at least 20 to ensure that exposure is below the lower action level.

HEARING PROTECTION

There are different sorts of hearing protection available however the recommended hearing protection for use within the National Ice Centre is the Laser-Lite Disposable Foam Ear Plugs SNR35.

FrequencyHz	MeanAttenuation (dB)	StandardDeviation (dB)	AssumedProtection (dB)
63	33.4	4.6	28.8
125	34.1	4.7	29.4
250	35.5	4.6	30.9
500	37.6	4.1	33.5
1000	34.9	5.0	29.9
2000	35.7	2.8	32.9
4000	42.5	2.9	39.6
8000	44.1	4.2	39.9

This protection has a Sound Noise Reduction (SNR) of 35 dB which would effectively reduce the loudest noise such as the event at 100 dB(A) and would therefore take the effective noise reduction down to approx 65 dB(A)

This protection would reduce any noise exposure that is possible within the building below 75 dB(A).

The above hearing protection is adequate in all circumstances if well maintained and worn correctly.

For example: If a concert was to last for 8 hours, at a level of Leq 100 dB(A) it would take 15 minutes of exposure to reach the 'Upper Action Level' but wearing these ear plugs, the action levels would never be reached.

As identified, the realistic time that amplified music is being played, would reduce the $L_{EP,d}$ to a figure between 95 dB(A) and 97 dB(A) and this means that the effective noise reduction would bring the levels down to around 65 dB(A)

Full details of all available hearing protection which may be available for use must be available within the National Ice Centre for employees to read.

TECHNICAL TERMS APPENDIX

Lp Instantaneous sound pressure level

Leq Average sound pressure level measured over period of time to give typical value for a particular activity.

L_{EP},d Personal daily exposure level to noise of employee.

(Examples: If employee works for 8 hours where typical Leq has been determined, then L_{EP},d = Leq)

If 12 hours L_{EP},d = Leq + 1.8
If 4 hours L_{EP},d = Leq - 3
In general: If t hours L_{EP},d = Leq + 10 log $\underline{t}$)

Technical Terms

1) The '**Lower Exposure Action**' values is:
   (a) a daily or weekly personal noise exposure of L_{EP},d 80 dB (A-weighted); and
   (b) a peak sound pressure of 135 dB (C-weighted).

2) The '**Upper Exposure Action**' values will be:
   (a) a daily or weekly personal noise exposure of L_{EP},d 85 dB (A-weighted); and
   (b) a peak sound pressure of 137 dB (C-weighted).

3) The '**Exposure Limit**' values will be:
   (a) a daily or weekly personal noise exposure of L_{EP},d 87 dB (A-weighted); and
   (b) a peak sound pressure of 140 dB (C-weighted.

If noise exposure levels of employees are at or above any of the above action levels then there are legal obligations that require compliance

Note: There is a legal obligation to reduce noise exposures, whenever reasonably practicable, even if exposures are below the above-mentioned action levels)

dB(A) are A-weighted levels

- which give a better indication of loudness.
- They are the units used throughout the Noise at Work Legislation with
- the exception of the Peak Action Level (dB)

SUMMARY OF LEGAL OBLIGATIONS WHERE NOISE EXPOSURES AT THE LOWER, UPPER AND PEAK ACTION LEVELS OCCUR

Hearing Protection

Where employees are exposed to not at or above the 85 dB(A) $L_{EP,d}$ Upper Action Level, or 200 Pascal (140 dB) Peak Action Level, the Regulations require you to reduce the noise exposure by other means, as far as this is reasonably practicable.

Where noise exposures are above 85 dB(A) (Upper level) or exceed the Peak Action Levels you will have to make sure that employees use the hearing protection at all times.

Between 80 dB(A) and 85dB(A) (Lower and Upper Action Levels) you should ensure:

- Appropriate hearing protection is freely available.
- The employees know that unless they wear it there is a potential risk to their hearing.

The Regulations do not, however, make it a legal duty for the workers to wear hearing protection below the Upper Action level, however good practice recommends that this is worn.

Below 80 dB(A) (Lower level), hearing protection is not required.

Hearing damage is cumulative and ensuring that young people in particular get into the routine of using hearing protection **before** their hearing is damaged.

Ear protection zones, where use of protection is compulsory, will have to be marked if this is reasonably practicable, using the sign shown opposite. Management are required to ensure that everyone who goes into a marked zone, even for a short time, uses ear protection.

Check to make sure your Programme is working

- Make sure that the protective equipment you provide is kept in good condition.
- If you rely on ear protectors - find out whether they are actually being used.
- It anything is wrong - don't neglect it - put it right, sometimes hearing might depend on it.

Employee Duties and Responsibilities

Programmes are only likely to succeed in preventing hearing damage where there is co-operation between management, the employees working in those areas and safety representatives.

To meet the requirement placed on employees by the Regulations they will need to:

- Wear ear protection (ear plugs or ear muffs) provided whenever they are in places where the Upper or Peak Action levels might be reached, and every time they go into an area marked as an ear protection zone.
- Use any other equipment the manager provides under the Regulations. For example, if the machine is intended to have a silencer fitted – not to take it off.
- Look after any equipment provided under the Regulations.
- Report to their immediate supervisor/manager any defects discovered in any of the equipment they have to use.
- Take on board all instruction and training that has been given in the use of equipment and ear protection.
- Co-operate with any person who undertakes a noise assessment of your work equipment.

AUDIOMETRY

Audiometric testing (test of hearing) is an essential part of any programme of hearing conservation. It provides a baseline measurement of an employee's hearing and helps to identify workers who may be particularly susceptible to noise induced hearing loss.

It also serves to demonstrate to the worker the effects of failure to wear hearing protection and assists in monitoring the effectiveness of a hearing conservation programme for a group of workers.

The National Ice Centre's Occupational Health Unit is responsible for audiometric testing and should be informed of all employees working in a 'hearing protection' zone and/or exposed to noise at or above the action levels.

This testing should be undertaken by staff, by appointment, annually for two years, then by an agreed testing period and subsequently a final test on exit from employment.

It is also the responsibility of management to keep the Occupational Health Unit informed of any changes in staff, and noise assessments in a hearing protection area.

Appendix 1:

Offsite Venues and Festival Sites

This assessment is to highlight that the National Ice Centre (NIC) is aware and actively managing noise producing activities located at offsite venues and music festivals. This document relates to offsite activities and is an appendix to the Nottingham City Council Noise Assessment to indicate risk management and safe measures implemented to protect staff working offsite.

The National Ice Centre operates and manages offsite merchandising and catering for other venues around the United Kingdom as well as has a developing portfolio of contracts to operate at music festivals across the United Kingdom and outside the UK. This appendix refers to two examples one of a festival site and one of an arena, the control measures will be adopted across all sites to ensure the most practical safe working measures are followed by staff. All control measures implemented at UK sites/venues will adhere to UK legislation and will also be adopted all sites/venues located outside the UK. In the event sites/venues are in a country with a higher standard of legislation to the UK, a dynamic risk assessment will be completed by the Departmental Manager/s operating the site for the NIC and will implement safety measures to ensure NIC staff are working within the country's legislation.

All sites and venues are very diverse with factors such as layout, environmental conditions, activities/music genres changing year to year and this appendix highlights that the NIC is actively managing these processes to maintain safety welfare.

Download Festival – Donington Park – June – Yearly:

This music festival has been chosen based on the genre of music being excessive rock and metal music as well as the merchandise and catering outlets being located close to a variety of stages and speakers. This festival attracts between 80-120 thousand customers over a 5-day period. Staff operating across festival sites may work in these locations for up to 12 hours per day over a 5-day period. Due to the frequency of amplified music at these sites staff will meet the upper exposure level within a short timeframe therefore increasing the need for PPE.

Upon set up at larger festivals such as Download Festival a representative from the site management attends all pitches and puts up noise warning signs in the marquees or trailers.

Supervisors overseeing sites they are required to sign to document they will adhere to and understand the dangers of excessive noise at these locations.

Supervisors of the operations will issue all staff with approved hearing protection.

Staff will wear hearing protection and abide by noise protection areas as designated by festival organisers.

Site Supervisors and Managers are required to complete regular audits of staff to ensure that they are wearing the protection as instructed. At other outdoor music festivals sites checks are not always in place however Managers/supervisors will still issue out the relevant hearing protection which is mandatory to wear.
The only alteration to this requirement would be if the pitch/trailer location is in an area in which the manager/supervisor deemed to be of low exposure risk, for example a pitch set up in a camp site or parking facility and is not near amplified music. The manager/supervisor will consider factors such as the distance to the arena areas, volume of person/vehicle and amplified music, period in which staff will be in the area, and activities in the surrounding area. They will then document their rational on the set-up briefing sheet.

Arena

The NIC operates merchandising and catering contracts at other Arena's nationally and internationally.
The NIC has conducted a generic LEQ test located at a central area within each of the venues, where NIC staff are working within the arena bowl.
As with the Motorpoint Arena in Nottingham the 3 Arena Dublin holds the same or similar event and shows.
Readings have been taken to identify any similarity's or differences in exposure levels between the venues that may impact in the way each venue is managed.
Readings will be conducted by a NIC manager or supervisor operating at each of the venue using the Decibel X Sound Meter Application on a mobile device.
Each assessment will be conducted for a 5-minute period and will be used to provide an overview of DB levels across a range of operating locations. Readings will be rounded to the nearest DB for example a reading of 85.5 would be recorded as 86Db and a reading of 85.4 would be rounded to 85Db. Any reading over 85 Db falls with then Upper Exposure level and would require Hearing protection to be implemented.

Assessment Readings:

	Motorpoint Arena Nottingham	**3 Arena Dublin**
Event	Olly Murs	The Vamps
Date	07.05.19	29.05.19
Music Genre	Pop music	Pop Music
LEq (DB)	96	98
8Hrs	96	98
4 Hrs	93	95
2 Hrs	90	92
1 Hrs	87	89
30 mins	84	86

***3db will be reduced per halved exposure length, this is based on a full shift being of an 8-hour period.**

Based on the readings staff in these locations will be issued with mandatory hearing protection. Supervisors will sign off their event check sheet to confirm that all staff have been issued with and understand that hearing protection is required in all areas. Staff will be issued with the same standard hearing protection as the NIC. Supervisors are also required to conduct staff audits to check hearing protection is being worn correctly by all working staff.