Assessment of risk arising from employees' exposure to noise in the workplace - Australian Scholarship Group

[2]

Executive Summary

An Occupational Health and Environmental Safety assessment of Australian Scholarships Group Friendly Society Limited (ASG) was conducted on 15 September 2009. The primary purpose of the report was to conduct a noise survey assessment of the organisation. For ethical reasons, an Occupational Health and Safety (OH&S) walkthrough visual inspection was conducted at no additional cost to the organisation. Approval of photographs for identification of hazards was granted by the CEO Mr. David Elder.

The noise exposure levels in the main call centre were found to be within the regulatory limits while the noise exposure of the power generator exceeded those limits only when it became operational for short periods of time, ranging between 2 to 3 hours. The noise levels in the main foyer, boardroom and staff facilities were not affected and were within the regulatory limits. The noise levels at the adjacent premises were negligible due to the distance from the generator and main building.

The current generator room door is replaced with a solid wooden door to reduce generator noise exposure. Hearing Protective Devices (HPD) to be replaced with approved HPD's. Appropriate signage advising of HPD, first aid kit and generator location be installed in the near term or within 12 months.

The results of the organisation's occupational health and safety records, signage, maintenance registers, security and staff training records indicated that it meets all the requirements of Occupational Health and Safety Regulations 2007. [5&9] An Occupation Health and Safety walkthrough report is attached as Annex A

Introduction

Main Offices.

"Australian Scholarships Group Friendly Society Limited (ASG) is a not for profit organisation that provides opportunities for students". [2] ABC Consultants were retained by Mr. David Elder, CEO of ASG to undertake an OH&S survey with emphasis on a noise assessment.

Purpose. The aim of the noise assessment was to record the noise exposure of the employees in specific locations within the generator area and to provide recommendations.

The report findings concerning OH&S will be in accordance with the Victorian Occupational Health and Safety Regulations 2007. [5&9] The noise exposure levels to employees have been compared with the Victorian OH&S Regulations 2007 [5 & 9], using instruments in accordance with Australian & New Zealand Standard AS/NZ 1269. [1] The report provides:

- OH&S survey Staff Geographic noise level measurements
- Recommendations for OH&S, noise controls and personal protection equipment

Geographic - Workplace practices and processes.

The organisation has two main sites, geographically located within a 500 metre radius. The buildings are separated by two roads within a busy intersection and shopping centre with 'line of sight" communications using infra red based at the highest point of the each premise. These antennae are highly directional radio frequency types that pose no hazard to employees. The main building containing the majority of the employees includes a call centre, reception, foyer, staff amenities, board room and a development department with above ground car park located at ground level.

ASG Satellite Photo [4]

The warehouse containing materials, brochures, display equipment, forklifts, vehicles, training rooms and administrative records was surveyed and complied with the provisions of the Occupational Health and Safety Regulations 2007. [5&9] The main concern was excessive noise exposure from the generator located within the underground car park at the front of the building.

At the time of the survey, apart from one set of ear muffs located on the right hand side of the access door, there were no other signs of controls in place. The generator room is mounted on a concrete foundation with numerous electrical feeders and air conditioning ducts protruding from the ceiling. The generator has a number of moving parts, with only the motor being encased in a metal base drum enclosure to reduce exposure. The door leading to the generator room consists of plywood which does not reduce noise exposure. The generator is operational during OH&S audits and/or whenever a power failure occurs.

Methods and Measurements

The sound level meters used during the noise level assessments were hand held devices. Noise measurements were taken of the main building which housed the offices, call centre and the generator using hand held sound level meters (SLM's). The sound level meters were calibrated prior to the 15 September 2009 and after the noise assessment was conducted. Noise sound level measurements were taken using sound level meters set to (slow) dynamic response and the A-weighted sound levels recorded using sound level meters at the start of day and follow-up measurements. These measurements were recorded at three points in time with windows closed and opened to compare recorded measurements and ascertain noise level during the operational duty cycle of the generator. The first measurements were taken at the beginning of the work day, 9:00 am, the second at 1:00 pm and the third at 4:30 pm. Sound level measurements undertaken near the call centre staff workstations were identified as the main area of concern. See sound level tables 1 to 3 below.

SLM [6]

These measurements were compared against the other two point measurements in time to identify any noise level differences. Sound level measurements were taken at each workstation within one meter of each staff member, each measurement being of two minutes duration. The measurement taken at the three points in time were in accordance to Australian and New Zealand Standard AS/NZS 1269. [1] Occupational Noise Management 2005 Part 1 Measurement and Assessment of Noise Omission and Exposure. [1] Furthermore the measurement results were compared with the Occupational Health and Safety Regulations 2007 [5&9] to ascertain noise limits. For consistency, the generator remained operational throughout the noise level survey.

Results

The generator sound level measurements are summarised in Table 1 with a site diagram indicating the sound level measurements at different locations. See site sound levels map below. Staff and geographical sound level measurements taken at 9:00 am, start of the day, followed by additional readings at 1.00 pm and 4.30 pm were compiled and summarised in a table format as shown in Tables 1 to 3 below.

The follow-up noise level measurements were found to mirror those measurements taken at the start of the day. Tables 1, to 3 also indicate the three time period measurements [7]:

Table 1 Generator [7]

No	Title	Location	9:00 am	1:00 pm	4:30 pm	Comments
1	Generator	Car park	89 dBA	88 dBA	87 dBA	One metre from control panel
			87 dBA	87 dBA	87 dBA	Generator door closed
2	Public	Entrance	91 dBA	92 dBA	91 dBA	Street, traffic & generator noise

Table 2 Main Building – Lower Ground [7]

No	Title	Location	9:00 am	1:00 pm	4:30 pm	Comments
1	Visitors	Foyer Ground floor	62 dBA	63 dBA	65 dBA	60cm Concrete walls, floor barriers & distance with added street noise
2	Ms. J. Robinson	Reception Ground floor	68 dBA	69 dBA	68 dBA	60cm Concrete walls, floor barriers & distance with added street noise
3	Executives	Board room Ground floor	60 dBA	60 dBA	60 dBA	60cm Concrete walls, floor barriers & distance
4	Mr. D. Elder	CEO office Ground floor	62 dBA	62 dBA	63 dBA	60cm Concrete walls, floor barriers & distance

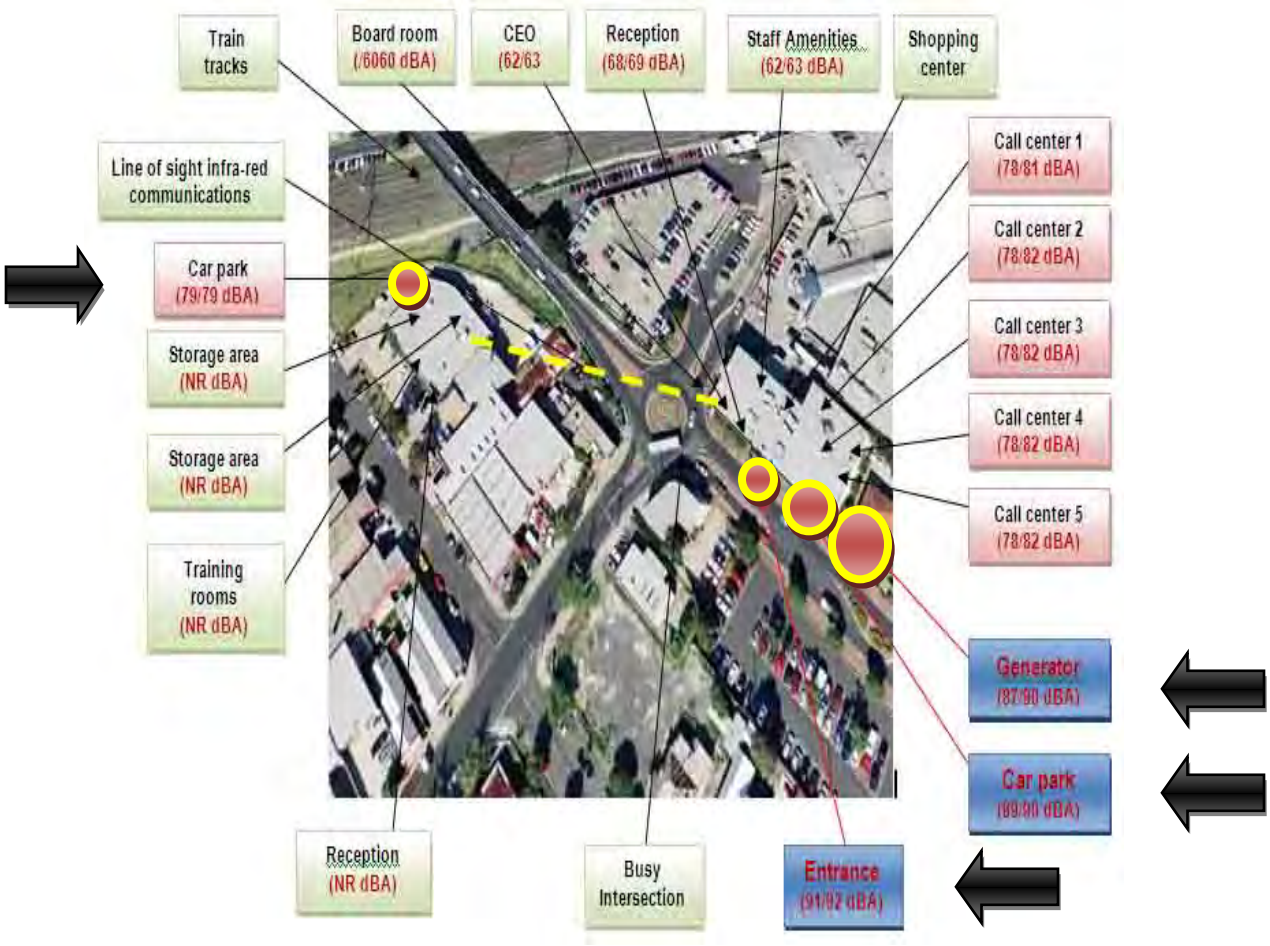
Table 2 (continued) Main Building – First Floor [7]

5	All staff	Amenities First floor	62 dBA	63 dBA	62 dBA	60cm Concrete walls, floor barriers & distance
6	Ms. B. McCrae	Call centre -1 First floor	78 dBA	78 dBA	79 dBA	Concrete walls, floor barriers & distance – Windows closed
			82 dBA	81 dBA	81 dBA	Windows open
7	Mrs. T. Poulos	Call centre -2 First floor	78 dBA	79 dBA	79 dBA	Concrete walls, floor barriers & distance – Windows closed
			82 dBA	81 dBA	81 dBA	Windows open
8	Ms. N. Jones	Call centre -3 First floor	78 dBA	79 dBA	79 dBA	Concrete walls, floor barriers & distance – Windows closed
			82 dBA	81 dBA	81 dBA	Windows open
9	Ms. P. Tankard	Call centre -4 First floor	78 dBA	79 dBA	79 dBA	Concrete walls, floor barriers & distance – Windows closed
			82 dBA	81 dBA	81 dBA	Windows open
10	Mrs. L. Cavalo	Call centre -5 First floor	78 dBA	79 dBA	79 dBA	Concrete walls, floor barriers & distance – Windows closed
			82 dBA	81 dBA	81 dBA	Windows open

Table 3 Warehouse [7]

No	Title	Location	9:00 am	1:00 pm	4:30 pm	Comments
1	Mrs. M. Bail	Reception	NR	NR	NR	No sound measurements reading taken due to distance
2	Mr. C. Lyle	Storage	NR	NR	NR	No sound measurements reading taken due to distance
3	Visitors	Car park	78 dBA	79 dBA	79 dBA	Train, street & traffic exposure
4	Staff	Training room	NR	NR	NR	No sound measurements reading taken due to distance

Sound Levels Site Map [8]



In the above site sound level map, distance between buildings can be seen clearly. The three main areas of concern are shown by the round red and yellow dots with black directional arrow. These are clearly marked as front entrance, the car park and the generator room. The car park at the warehouse building can be seen in the top left corner of the site map near the railway lines and the overhead traffic bridge. The line of sight microwave communications is depicted as a yellow broken line. The radio frequencies are directionally horizontally based and are of no harm to the human occupants of the buildings.

Discussion

Regulatory guideline requirements. Within the state of Victoria it is a regulatory requirement that the noise level at the exposed ear of any employee should not exceed the average A-weighted sound level for eight hours of 85 dBA of which there is also a peak sound level of 140 dBC sound level limit, which is not to be exceeded at any time during the work shift. If an employee is found to be exposed to noise above or beyond the limits indicated above, employers are required to ensure that the source of the noise is controlled, isolated or reduced by engineering and/or administrative controls. If this is not possible then the employer must provide personal protective equipment (hearing protection devices) to the employees. If hearing protection devices and/or administrative controls are implemented, then an audiometric test program must also be carried out accordance with the regulations.

Furthermore it is important to understand that the extent of the noise exposure will depend upon the noise level and the length of time to which an individual is exposed. For comparison, an average exposure of 85 dBA for eight hours is a greater hazard than say 93 dBA for sixty minutes with no other significant exposure of >75 dBA over the course of a work shift. To provide reliable data, sound level meters were used throughout the noise assessment with spot checks being conducted beyond the three time periods to check their validity. The spot checks proved to be good barometer checks in comparing the readings throughout the day.

Based on the organisations safety, maintenance, and generator audit records, electricity blackouts were rare and it is highly unlikely that the generator would be operational for periods in excess of six hours. In the event of an extreme case, the controls being recommended will reduce the noise levels. From an occupational noise exposure point of view, the most important results are the staff sound level measurements. The sound level measurements exceeded the regulatory peak limits for the generator's operator throughout all three time periods. The combination of administrative, engineering controls and personal protection equipment are considered sufficient to reduce the noise level exposure during the operational aspects of the generator.

Generator Room

The findings for this location were 87 to 91 dBA at 9:00 am, followed by 87 to 92 at 1:00 pm and 87 to 91 dBA at 4:30 pm. The results indicate that exposure limits were exceeded. The generator room is a confined space containing the generator, cleaning chemicals and maintenance equipment. Electrical wiring was not tagged and access door surrounded by rubbish bins. The access fire door is inadequate and be replaced.

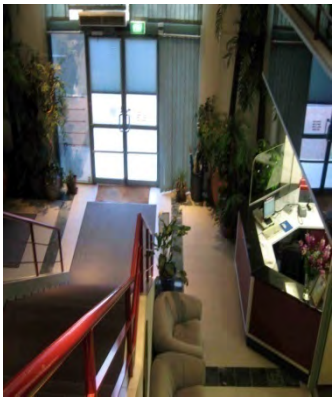
Generator

Generator entrance

Main Building

Foyer and reception.

The findings for this location were 62 to 68 dBA at 9:00 am, followed by 63 to 69 at 1:00 pm and 65 to 68 dBA at 4:30 pm. The results indicate that exposure did not exceed the limits. The reasons for this are due to the thickness of the walls and the concrete floors that separated the first floor from the generator.



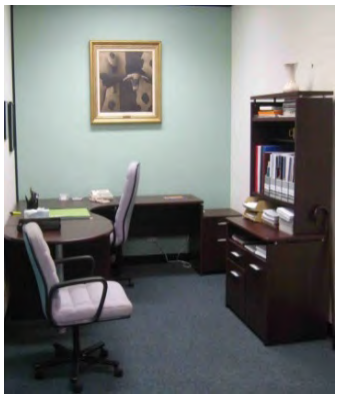
1.Reception (69 dBA)

2.Foyer (69 dBA)

Board room and CEO office.

The findings for this location were 60 to 62 dBA at 9:00 am, followed by 60 to 62 at 1:00 pm and 60 to 63 dBA at 4:30 pm. The results indicate that exposure did not exceed the limits. The reasons for this are due to the thickness of the walls and the concrete floors and the distance from the generator.

3.Board Room (63 dBA)

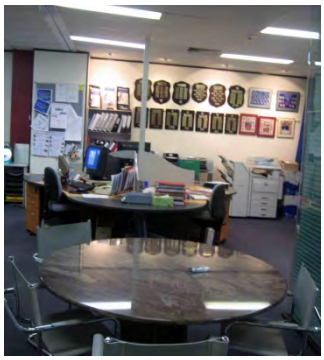


4.CEO Office (63 dBA)

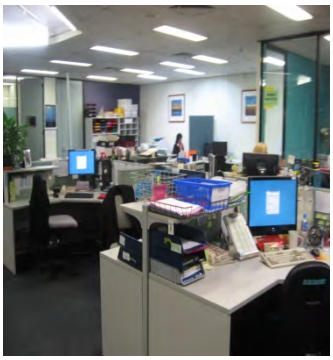
Amenities & Call centre stations 1 to 5.

The findings for this location were 62 to 82 dBA at 9:00 am, followed by 63 to 81 at 1:00 pm and 62 to 61 dBA at 4:30 pm. The results indicate that exposure did not exceed the limits.

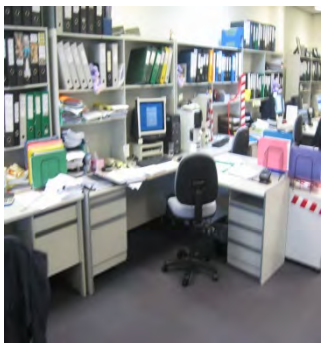
The reasons for this are due to the thickness of the walls and the concrete floors and the distance from the generator. The higher readings were due to the windows being left open that included street and vehicle traffic noise in the measurements.



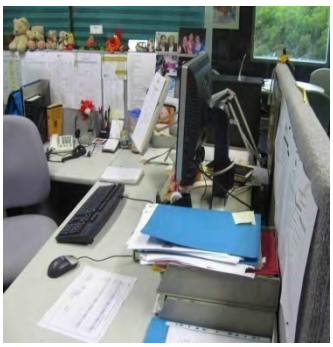
5.Staff amenities (82dBA)



6.Call centre-1&2 (81 dBA)



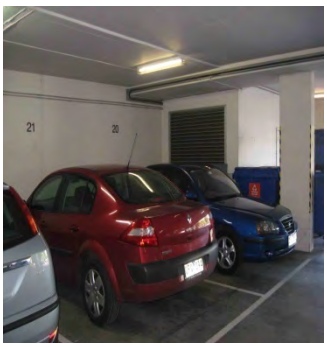
7.Call centre-3&4 (81 dBA)



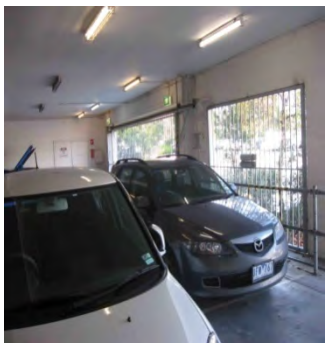
8.Call centre-5 (81 dBA)

Main building Car park.

The findings for this location were 90 dBA at 9:00 am, followed by 90 at 1:00 pm and 89 to 61 dBA at 430 pm. The main reason for the high measurements was due to the street and traffic noise.



9. Car park (90 dBA)



10. Generator (90 dBA)

In this situation, engineering, and administrative controls are necessary to reduce the noise when the generator is operational. In addition the operator is to be provided with hearing protection devices in accordance with Australian and New Zealand Standards AS/NZS 1269. [1]

Warehouse

Training room, Reception & Storage.

The findings at this location were quite negligible due to the distance from the generator. Apart from the car park it was considered not necessary to take any noise level measurements. See Annex A for additional information on storage.

11. Training room (NR dBA)

12. Reception (NR dBA)

Warehouse car park.

The noise measurements being taken of the car park and smokers' area were to measure the difference between street and internal noise sound levels. Street noise, vehicle traffic and trains were the main source of noise.

13. Car park (79 dBA)

14. Car park smokers (79 dBA)

Recommendations

The recommendations shown below are in accordance with the duties of employers as per Division 1, Part 3 of the OHS regulations 2007 [5&9] - Control of exposure to noise. To comply with the relevant section 12 (2) of the regulations, management will need to ensure that the following recommendations are implemented in the near term or within 12 months. In the event the recommendations have not been carried out, it is requested that we be advised when the recommendations will be implemented and/or whether alternative control measures are being implemented.

a. Signs that indicate hearing protection are to be worn in the vicinity of the generator.

b. The generator room door is replaced and a heavy noise insulated door be installed.

c. A battery powered warning light is installed outside the generator room in the event of an emergency.

d. Ensure that all rubbish bins and other materials are kept well clear of the entrance to the generator room.

e. Vibration measurements are taken of the generator to provide a baseline for future maintenance.

f. Advice to staff by email, telephone or in advance when the generator is to be operational.

Conclusion

An analysis of the measurements taken on the 15 September 2009 indicated that the noise exposure at the main building offices were within the regulatory requirements. The organisation's building materials act as a natural barrier against noise from the generator when in operation. Furthermore the distance from the source of the noise is another factor that provides additional relief and by implementing the above recommendations it will demonstrate greater compliance to the regulations. [5&9] The noise levels at the second premises were considered negligible and having little or no effect on the work force that were employed within. However a noise level assessment was made of the car park to ascertain the street noise levels.

Whilst it is outside our terms of reference it may be necessary to conduct a vibration assessment on the generator as a means of identifying and predicting potential damage to moving parts. The relevance of conducting a vibration test is to assist management with machine maintenance and reduction of costs. It is suggested that a follow up visit be conducted within 12 months to ascertain the effectiveness of the recommendations and impact on workers.

Peter Adamis

REFERENCES

1. Australian and New Zealand Standard AS/NZS 1269

2. Australian Scholarship Group logo. http://www.asg.com.au/

3. Books image, http://www.edusafe.edu.au/curtin/resources.html#standards

4. Google satellite map, Imagery date 13 February 2006

5. Revocation of OH&S Regulations - http://www.austlii.edu.au/au/legis/vic/num_reg/ohasr2007n54o2007463/

6. Sound Level Meter image. http://www.triosmartcal.com.au/images/casella_cel620.jpg

7. Table formats, Adamis, P. 8 October 2009

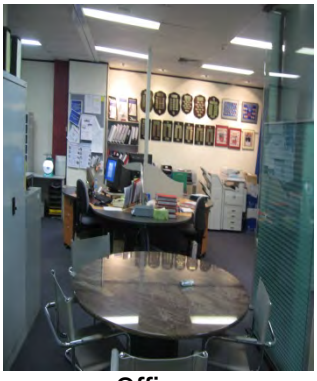
8. Sound Levels Site Map, Adamis, P. 8 October 2009.

9. Victorian OH&S 2007, http://www.austlii.edu.au/au/legis/vic/num_reg/ohasr2007n54o2007463/

OBSERVATIONAL OCCUPATIONAL HEALTH AND SAFETY WALKTHROUGH SURVEY RESULTS

The information provided below is the result of the OH&S observational walkthrough conducted on the 15 September 2009 in conjunction with the noise assessment survey. The 15 suggested recommendations are supplemented by photographs. Please note that the observational walkthrough survey is not an additional cost to the organisation and was conducted from an ethical point of view. Services will only be charged for the noise assessment survey.

1. Offices. The main building housing the main offices was found free of any hazards. The assessment concluded that appropriate administrative controls were in place and complied with the OHS regulations 2007.



Offices

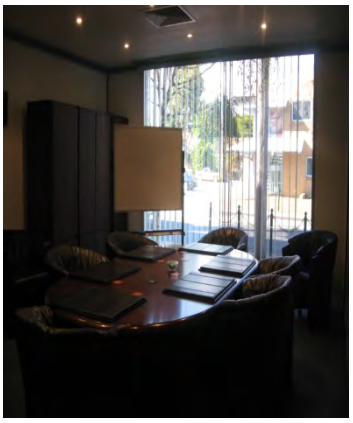
2. Work station wiring The electrical wiring leads were found entangled on the floor near the staff walk through aisle creating a hazard when walking past the workstation. It is suggested that electrical wiring be secured.

Work station wiring

3. Call Centre extinguishers. A powder fire extinguisher was found which if used may clog the electrical systems. It is suggested that a CO2 extinguisher be installed to replace the powder type.

Call Centre extinguishers

4. Board room. The board room is sound-proof and locked from within. This constitutes a fire hazard if a fire is in the board room. Access to the board room is not available for any person attempting to enter. It is suggested that locks be changed.



Board room access

5. Contractors. A check of the visitors' sign in book was conducted and found that it had not been completed for the day. It is suggested that all contractors and visitors sign in the visitor's book held at the reception in both buildings.

Contractors & Visitors

6. Infra-red line of sight communications. An observational view of the infra-red line of sight communication network found that it was compliant with current regulations.

Infra-red communications

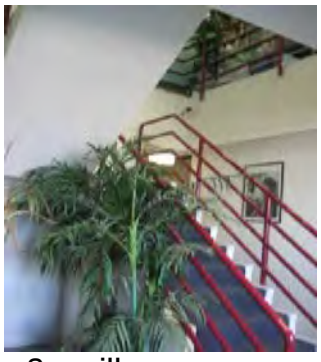
7. Car park entrance. The vehicles entering and leaving the premises from the main building are blind to the public and outer traffic. It is suggested that suitable flashing lights be installed to forewarn the public and traffic.

Vehicle car exit lights

8. Emergency procedures. There are four exit points located near the stairwell which are well equipped with signage. Emergency equipment and devices complied with the regulations.

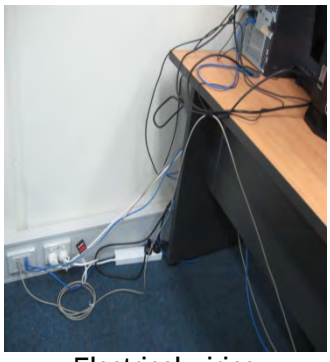
Fire Warden equipment

9. Security. Both premises are considered secured from any external threats to person, material, records and information technology.



Surveillance cameras

10. Electrical wiring. The wiring in the photograph indicates the poor wiring practices throughout the two premises. The computer cables should also be separated from the electrical leads



Electrical wiring

11. Roof Access. A harness & lanyard lines was stored within the storage room for access to the roof. It is suggested that an engineer be consulted to ensure that the bar or metal support can hold the weight of an average person.

Roof Access

12. Storage. The warehouse educational supply & administrative records storage should have a long reach racking ladder. Ladders should be in all locations to reduce risks and the onset of shoulder pain associated with manual handling.

Storage

13. Forklifts Victoria has a zero tolerance policy on the unsafe & illegal control forklifts driving. A check of operator's credentials confirmed certification. It is suggested bollards be installed to minimise damage to shelves.

Forklift

14. Racking It is suggested that shelving be secured to the walls by a steel chain, bolts and/or steel plates to stop the onset of any damage to the shelves. Securing shelves will reduce rocking effect.

Racks

15. Generator Room.
The generator room is a confined space. Cleaning and Maintenance contractors store cleaning and equipment within the room. It is suggested that the room be free of equipment and cleaning products. All electrical wiring should be tagged.


Generator


Generator entrance

Current ear protection

Housing Keeping Recommendations. In the interests of good housekeeping, it is suggested that the following recommendations also be considered:

- Generator room. Removal of all cleaning products and maintenance equipment will assist operators in the performance of their duties. Ensure entrance to the generator is clear of bins, equipment and other material. Consider a First aid kit be installed with the PPE outside the generator room.
- Cleaning chemicals & maintenance equipment. Appropriate storage of these items stored in a suitable facility in line with OHS regulations 2007.
- Warning light at car park entrance. A warning flashing light be installed at the front of the main building to warn external traffic of vehicles exiting.
- Ladders in warehouse. Consider purchasing additional ladders for the warehouse storage areas. To reduce health disorders arising from manual handling.
- Smokers bins. Consider smokers bins be allocated outside the smokers area in the warehouse car park.
- Vibration assessments. Consider vibration measurements be taken of the generator and thus reduce costs on potential expensive maintenance.
- Lighting. Consider installing energy saver lights in the two premises and reduce costs.
- Water tank. Consider installation of a water tank and save costs watering gardens.
- Intranet. Consider the implementation of an organisation "intranet' as a means of reducing communication costs.