WCB / NOVA SCOTIA

WORKBOOK

Risk Mapping Tool

Identify, assess, and control injury hazards in your workplace

Occupational health and safety risk mapping tool

This Occupational Health and Safety (OH&S) Risk Mapping Tool can be used in any workplace or work area and can be very effective in helping reduce injuries at work. Workplace parties (employers, workers, Joint Occupational Health and Safety Committee members, safety representatives, etc.) can use this tool to help identify, assess, and control injury hazards in the workplace.

Hazards in the workplace include:

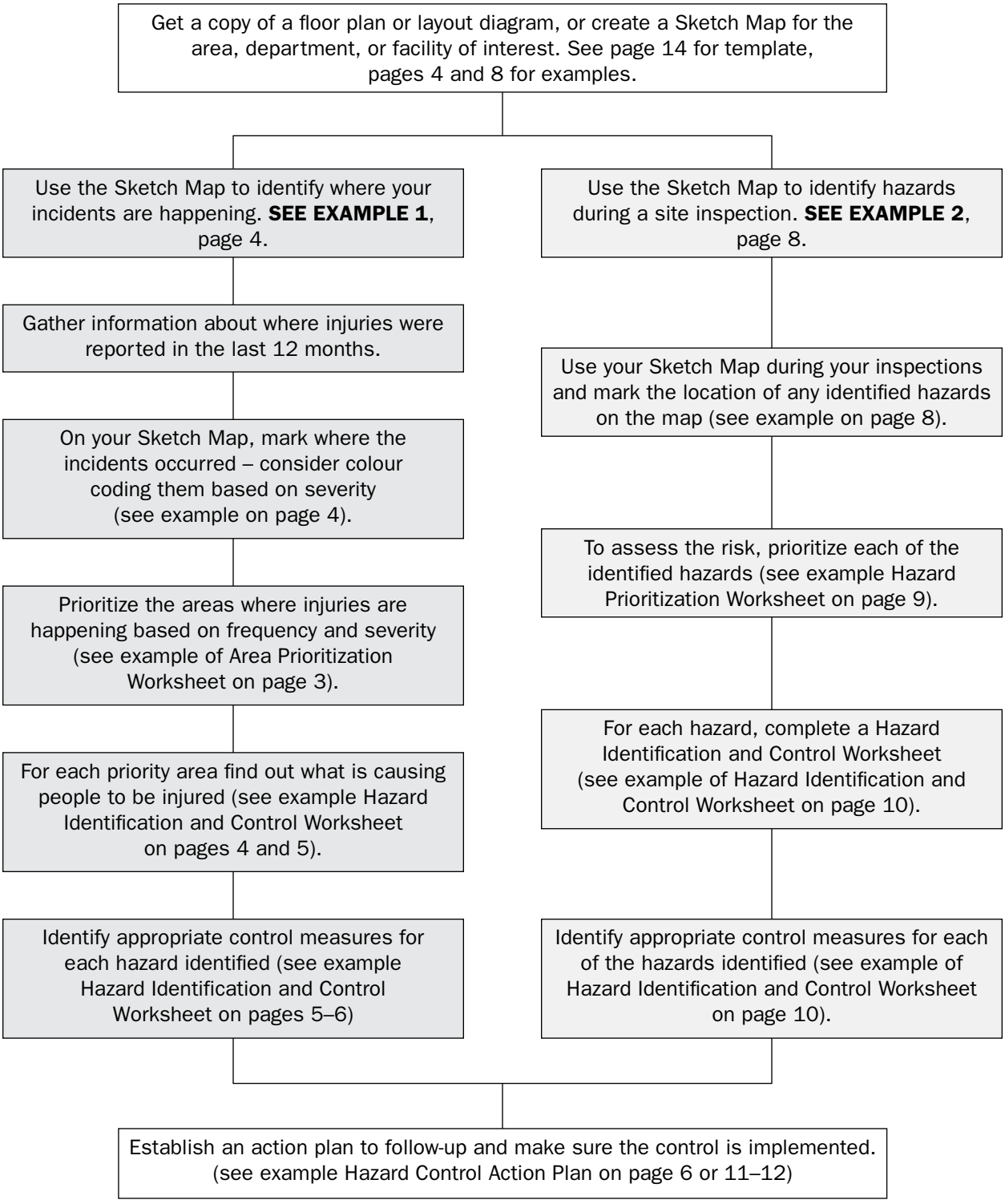
- Chemical Hazards
- Physical Hazards
- Biological Hazards
- Ergonomic Hazards
- Psychosocial Hazards

How to use the OH&S Risk Mapping Tool

The OH&S Risk Mapping Tool is designed to be used in two ways. First, it can help you identify where and why your employees are being injured. Second, it can be used as a proactive inspection tool to help identify where hazards exist, even if no incidents have yet occurred. The flow chart that follows outlines the basic steps for each option. Detailed information about each step, for both options, can be found in the rest of the document.

The Sketch Map, Hazard Identification and Control Worksheet, and Hazard Control Action Plan samples in this booklet can be adapted to address any cause of injury.

OH&S Risk Mapping Tool Flow Chart



Option 1: Where are your incidents happening and why?

- If you can, get a copy of a diagram that shows the layout of your facility, including outside areas such as parking lots. Many organizations will have an evacuation diagram that could be used for risk mapping. If this is not available, draw a sketch map of the area. Note that the sketch map does not need to be a work of art or even to scale, as long as it represents the workplace affected. For larger facilities, it may be helpful to create a different sketch map for different and/or smaller areas of the facility (e.g. one for each floor, one for the warehouse, and one for the office areas, etc.).

- Gather information about where your incidents were reported in the last 12 months. You can get this from:
  - A review of the past year's incident reports, near miss reports, and incident investigations
  - Talking with workers and asking them if they have had an incident or a near miss, and where it happened
  - Compare what you learned from the workers with the data from the review of the incident reports, etc.

- Once you have gathered all the information about the past year's incidents mark where they happened on the map. Any locations with multiple incidents (e.g. 'hotspots') will quickly show up on the Sketch Map. See example on page 4.

- Prioritize the areas where your incidents are happening based on the frequency and severity of the incident. See an example of an Area Prioritization Worksheet – Option 1 below. A blank template version of the worksheet can be found on page 15.

Example of Area Prioritization Worksheet – Option 1 for Sketch Map 1 (see page 4)

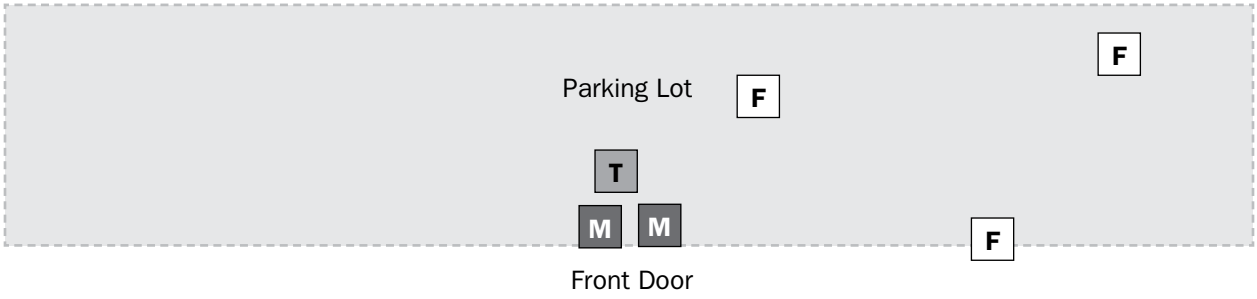
Area	Total # incidents	# of TL (Time Lost)	TL Score (# of TL x 10)	# MA (Med Aid)	MA Score (# of MA x 5)	#FA or RO (First Aid or Report Only)	FA or RO Score (# FA or RO x 1)	Total Score (TL Score + MA Score + FA or RO Score)	Priority
Parking Lot	6	1	10	2	10	3	3	23	3
Production Area	10	4	40	2	10	4	4	54	1
Back Exit	16	0	0	6	30	10	10	40	2
Reception	1	1	20	0	0	0	0	10	4

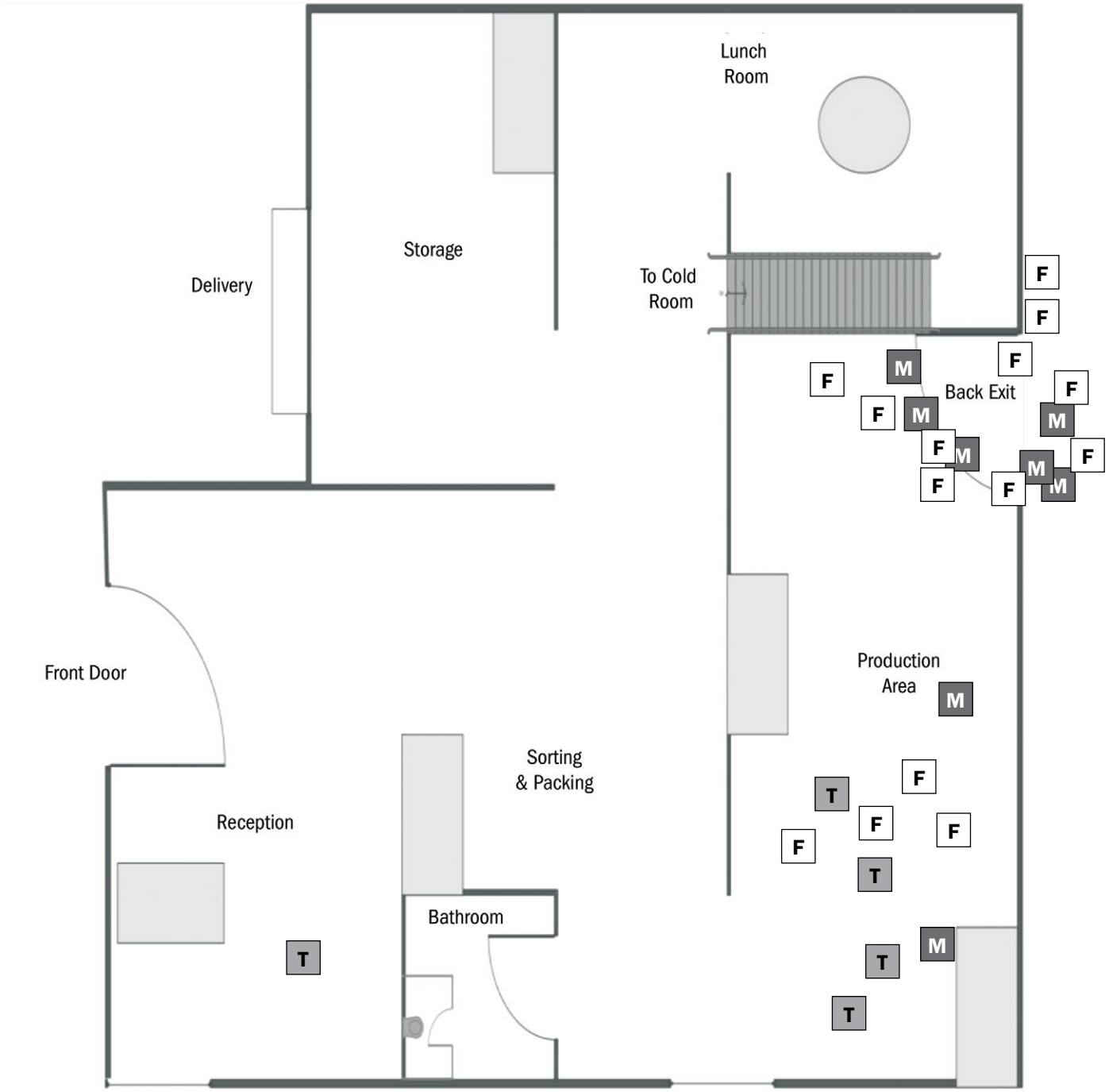
- For each area, in order of priority, find out what is causing the incident. This is called hazard identification. See an example of a Hazard Identification and Control Worksheet on pages 5–6. A blank template version of the worksheet can be found on page 17. This is done by going back to the incident reports and/or incident investigations to determine root causes.

- If there is no incident report, or the incident wasn't adequately investigated, interview the worker(s) involved to find out what happened. Document the possible causes of the incident (see "Inspection Areas with hazards to look for and possible controls" on page 19). Consider taking pictures of the area/hazard if this will help when communicating with others about the need for controls.

Sketch Map Example 1

T = Time Loss M = Medical Aid F = First Aid/Report Only





- The next step is to identify appropriate control measures for each of the hazards identified. This information can be found and compiled from the incident investigation forms that were completed for each incident that occurred in each priority area. If this information isn't available you should:
  - Consider a variety of approaches to control the identified hazard and, in consultation with appropriate workplace parties (e.g. staff and managers from departments where incidents took place, facilities and/or environmental services, engineering, and human resources, etc.), select a preferred control approach. See "Inspection Areas with hazards to look for and possible controls" on page 19 for various control ideas.

Example of Hazard Identification and Control Worksheet for Sketch Map Example 1 (see page 4)

Priority	Area/ Location	Hazard	Control
1	Production Area	Four of the reported incidents were pinched fingers in conveyer or other machinery.	**Short-term solution** – Refresher training on safe work practices. Put warning signs in area to increase awareness. **Long-term solution** – Install guards on machinery at 'pinch point' areas.
		There have been 2 time-loss injuries for a back and shoulder injury from a tall person and a short person working continuously on workstations in production line that are not the proper height for either.	**Short-term solution** – Raise the workstation onto blocks for the tall worker, provide a raised platform for the shorter worker to stand on, implement job rotation at regular intervals throughout the work day to ensure different muscle groups are being used. **Long-term solution** – include a plan to purchase and install easily adjustable work stations or standing stations, in next year's capital projects.
2	Back Exit	Five of the medical aid incidents were due to physically lifting or moving heavy equipment.	**Short-term solution** – Give training on material handling and limit individual maximum lifting weights. **Long-term solution** – Develop standard operating procedures for moving equipment and acquire push cart dolly and a pallet jack.
		Four of the incidents that required first aid were to treat cuts and minor bumps to the head. Workers bumped their heads while putting boxes on the bottom shelf of the racks.	**Short-term solution** – Spray paint the shelves with high-vis orange safety paint, zip tie split pool noodles to the edge of the second shelf or introduce wearing hard hats for this task. **Long-term solution** – Look at push back flow racks that allow for easy stacking on the shelves without the need to reach in and under the second shelf.
3	Parking Lot	Transition area from parking lot to building ices up in the winter due to poor drainage.	**Short-term solution** – Schedule snow clearing, salting/ sanding of walking path from parking lot to building 30 minutes prior to business day and ongoing monitoring throughout operational time. **Long-term solution** – Include a plan for regrading path in next year's capital projects.

Priority	Area/ Location	Hazard	Control
4	Reception	A time-loss injury took place involving a customer physically attacking the receptionist over a billing error on the account.	**Short-term solution** – Customer notified that he/she can only interact with employees via phone or email and a storage unit was moved to block access to the office area by the public and staff are directed to use the alternative entry point. **Long-term solution** – Reception area to be reconfigured with a polycarbonate window including a communication slot, to separate the public from the staff member. Swipe card system installed at all doors past the front entrance to limit access to staff only.

- Once the preferred controls have been identified:
  - Establish a plan to follow-up and make sure the control is implemented. See example Hazard Control Action Plan For Sketch Map Example 1 below
  - Continue to monitor the area to ensure control measures put in place are working
  - If the control is not working, investigate to determine why not and develop a plan to address the reasons why the control measures are not working
  - Make sure that all staff are made aware that the controls were put in place to prevent future incidents.

Example of Hazard Control Action Plan for Sketch Map Example 1 (see page 4)

Area/ Location	Brief Description of Hazard	Brief Description of Control	Person Responsible	Date to be Completed By	Status
Parking Lot	Large pot holes and broken pavement	Maintenance to fill in potholes and remove large loose pieces of pavement.	Bill Wood, Maintenance Manager	June 20	
		Include parking lot in monthly inspection process.	Judy Smith, H&S Manager; Sam Jones, Facilities Manager	June 1	
		Plan for repaving of parking lot in next year's capital projects.	Susan Frank, CEO Les Jamison, Director of Eng.	September 30	

Option 2: Using the tool during inspections to help identify hazards

Workplace teams can use this tool to help them identify hazards during regular inspections. During inspections, you should look for hazards and mark them on your sketch map. See “Inspection Areas with hazards to look for and possible controls” on page 19 for a list of things to look for, but don’t be limited by the list.

- If you can, get a copy of a diagram that shows the layout of your facility, including outside areas such as parking lots. Many organizations will have an evacuation diagram that could be used for risk mapping. If this is not available, draw a sketch map of the area (See Sketch Map Example 2 on page 8). Note that the sketch map does not need to be a work of art or even to scale, as long as it represents the workplace affected. For larger facilities, it may be helpful to create a different sketch map for different and/or smaller areas of the facility (e.g. one for each floor, one for the warehouse, and one for the office areas, etc.)

- Once you have your sketch map, use it during your inspection(s) of your facility, department, or work area. When you have identified a hazard, mark down its location on the sketch map (E.g. use a red marker to indicate the location on the map), and then write a short note to identify what the hazard(s) is.

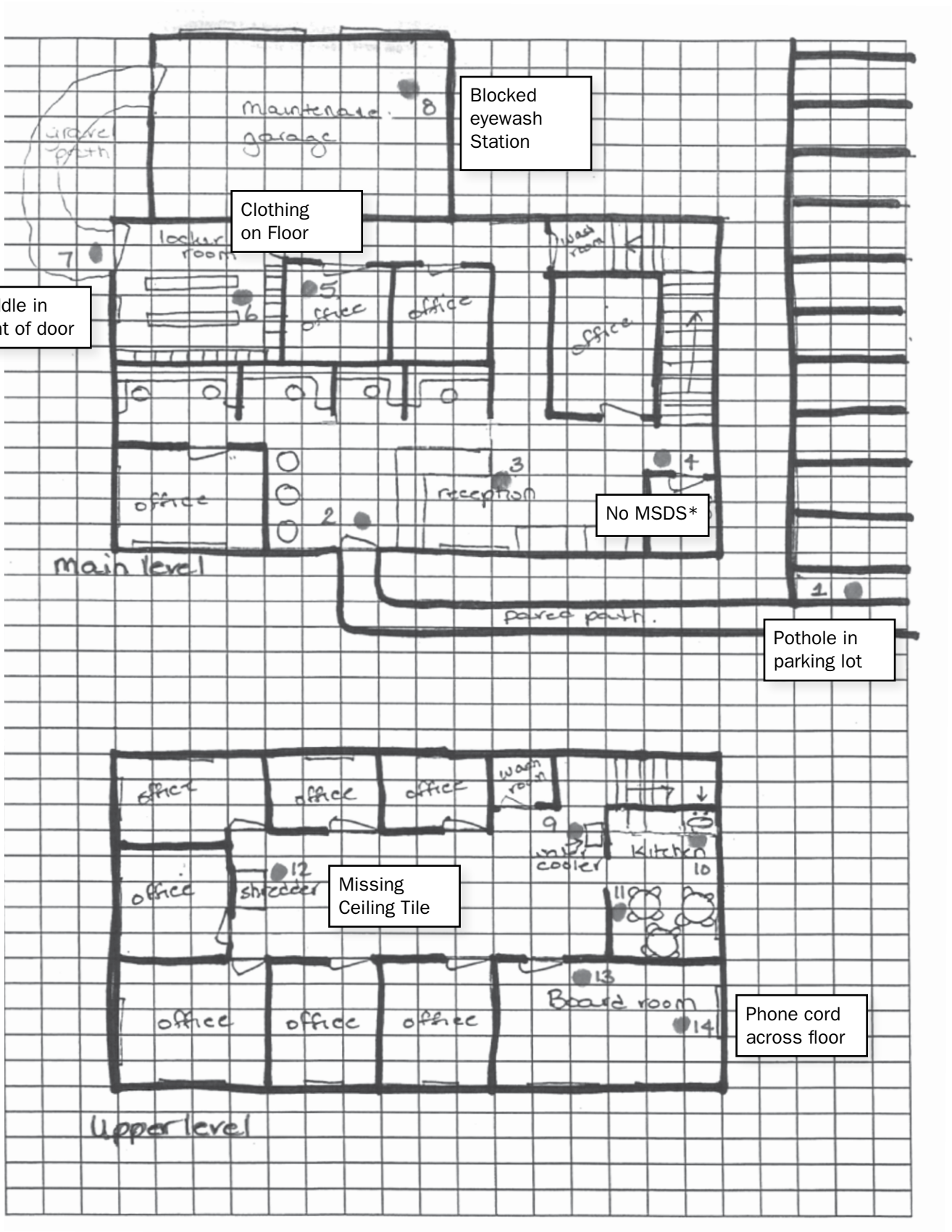
- Before moving on, you should assess the risk associated with each of the identified hazards and prioritize them. This will allow you to plan for the implementation of controls based on the level of risk associated with the hazards. For each of the hazards you have identified on the sketch map, answer yes or no to each of the four points in the Hazard Simple Risk Assessment process described below. In each of the worksheet’s rows, write in the area and identified hazard and then answer yes or no to each point. The more ‘yeses,’ the higher the priority. See the example Prioritization Worksheet – Option 2 on page 9.

NOTE: If you find a hazard during your inspection that you can do something about, then you should! You must, however, make note of the hazard on the sketch map so that you can assess the risk for the hazard and implement a control to reduce the risk of an incident.

Hazard Simple Risk Assessment

- The hazard has been previously identified (e.g. during past inspections, reported by workers, etc.)
- Control measures have not been put into place to prevent the hazard from occurring or to reduce the risk associated with the hazard
- Workers exposed to hazard during regular operations/work
- The hazard is known to have contributed to related incidents

Sketch Map Example 2



* MSDS: Material Safety Data Sheets (from controlled chemicals)

Example of Hazard Prioritization Worksheet – Option 2 for Sketch Map 2 (see page 8)

Area/ Location	Hazard	Previously Identified (Y/N)	Control Measures not in place (Y/N)	Exposed during regular operations (Y/N)	Previous Incidents (Y/N)	Total Score (# of Y)	Priority
Storage Room	No MSDS	Y	N	Y	N	2	3
Upper Level	Exposed Ceiling Tile	Y	N	Y	N	2	3
Parking	Pot Holes	Y	Y	Y	Y	4	1
Gravel Path	Puddles	N	N	Y	N	1	4
Maintenance Garage	Clutter stored in front of eyewash station	Y	N	Y	Y	3	2

- For each of the identified hazards, begin to complete the Hazard Identification and Control Worksheet – enter the priority number for each hazard and provide a more complete description for each of the hazards identified, in each location.

- The next step is to identify appropriate control measures for each of the hazards identified. If the hazard has contributed to known incidents, the related incident investigation forms should provide some information about possible control measures. If this information isn't available you should:
  - Consider a variety of approaches to control the identified hazard and, in consultation with appropriate workplace parties (e.g. staff and managers from departments where incidents took place, facilities and/or environmental services, engineering, and human resources, etc.), select a preferred control approach. "Inspection Areas with hazards to look for and possible controls" on page 19 for various control ideas.

- Enter the recommended hazard controls into the Hazard Identification and Control Worksheet. See the Hazard Identification and Control Worksheet Example for Sketch Map Example on page 10.

NOTE: If you find a hazard that has been previously identified, and where a control measure has been implemented, **but** incidents are still occurring, you should make it a priority to review the control measure to find out why it isn't working.

Example of Hazard Identification and Control Worksheet for Sketch Map 2 (see page 8)

Priority	Area/ Location	Hazard	Control
1	Parking lot	1 – Potholes	**Short-term solution** – Maintenance to fill in potholes and remove large loose pieces of pavement. Include parking lot in monthly inspection process. **Long-term solution** – Include a plan for repaving of parking lot in next year's capital projects.
2	Mainte-nance Garage	8 – Clutter stored in front of eyewash station – unable to ac-cess in an emergency	**Short-term solution** – Remove clutter and store elsewhere. Post signage to keep area free of clutter. Include a reminder in the weekly safety talk about the importance of maintaining a clear path to all emergency equipment. **Long-term solution** – Paint a yellow area on floor in front of eye wash to signify "no storage area." Review all emergency equipment throughout the facility and ensure they have clear access at all times.
3	Storage Room	4 – No MSDS (Material Safety Data Sheets)	**Short-term solution** – Catalogue all dangerous products/ substances and have their accompanying SDS (Safety Data Sheets) sheets available in a binder. **Long-term solution** – Paint a yellow area on floor in front of eye wash to signify "no storage area." Review all emergency equipment throughout the facility and ensure they have clear access at all times.
	Upper level/near shredder	12 – Exposed ceiling tile	**Short-term solution** – Replace ceiling tile to prevent the spread of smoke and hot gases in the event of a fire. **Long-term solution** – Have extra tiles ready in storage for immediate replacement of damaged or missing tiles.
4	Gravel Path	7 – Puddle by entrance	**Short-term solution** – Clean up puddle, put warning signage by door. **Long-term solution** – Grade pathway on a slight decline to avoid water build up.

- Once the preferred controls have been identified:
  - Establish a plan to follow-up and make sure the control is implemented. See example Hazard Control Action Plan for Sketch Map Example 2 on page 11.
  - Continue to monitor the area to ensure control measures put in place are working.
  - If the control is not working, investigate to determine why not and develop a plan to address the reasons why the control measures are not working.
  - Make sure all staff are made aware that the controls were put in place to prevent future incidents.

Example of Hazard Control Action Plan for Sketch Map Example 2 (see page 8)

Area/ Location	Brief Description of Hazard	Brief Description of Control	Person Responsible	Date to be Completed	Status
Parking Lot	Large potholes and broken pavement	Maintenance to fill in potholes and remove large loose pieces of pavement	Bill Wood, Maintenance Manager	June 20	
		Include parking lot in monthly inspection process	Judy Smith, H&S Manager Sam Jones, Facilities Manager	June 6	
		Plan for repaving of parking lot in next year's capital projects	Susan Frank, CEO Les Jamison, Director of Eng.	September 20	
Main Level (Storage)	Missing MSDS sheets for hazardous products	Inventory products on site, print accompanying SDS sheets, store in available binder.	Judy Smith, H&S Manager Sam Jones, Facilities Manager	June 10	
		Have all staff WHMIS trained and develop new product awareness policy	Judy Smith, H&S Manager	August 28	
Upper Level (Near Shredder)	Exposed ceiling tile – risk spread of fire	Replace ceiling tile	Sam Jones, Facilities Manager	Completed during inspection	complete
		Order extra tiles for storage for future replacement of damaged or missing tiles	Sam Jones, Facilities Manager	June 20	
Maintenance Garage	Clutter stored in front of eye-wash station – unable to access in an emergency	Remove clutter and store elsewhere.	John Franko, JOHSC member	Completed during inspection	complete
		Post signage to be area free of clutter.	Bill Wood, Maintenance Manager	June 2	
		Include a reminder in the weekly safety talk about the importance of maintaining a clear path to all emergency equipment.	Bill Wood, Maintenance Manager	June 5	
		Paint yellow area on floor in front of eye wash to signify "no storage area" during 2 week shut down	Bill Wood, Maintenance Manager	July 20	

Area/ Location	Brief Description of Hazard	Brief Description of Control	Person Responsible	Date to be Completed	Status
Gravel Path	Puddle In Front of Door	Clean up puddle, put warning signage by door.	Sam Jones, Facilities Manager	Completed during Inspection	Complete
		Grade pathway on a slight decline to avoid water build up.	Bill Wood, Maintenance Manager	September 13	

Further help and information

Managing Hazards in the Workplace:
The Canadian Centre for Occupational Health and Safety provides an introduction to:

- Chemical Hazards
- Physical Hazards
- Biological Hazards
- Ergonomic Hazards
- Psychosocial Hazards

Chemical safety includes the requirement for WHMIS training. To learn more about employer and worker responsibilities for chemical safety visit:

- Nova Scotia OHS Division: Guide to WHMIS
- Nova Scotia OHS Division: WHMIS in the Workplace: Employer Responsibilities
- Canadian Centre for Occupational Health and Safety – WHMIS
- Government of Canada: Occupational Health and Safety – WHMIS (federal employers)

Managing hazards is supported by understanding safety law and ensuring effective hazard identification, reporting, assessment, and control measures are in place. To learn about employer obligations and worker rights and responsibilities, visit

- Nova Scotia OHS Division Your Rights and Responsibilities: The OHS Act
- Employer resources at WCB Nova Scotia worksafeforlife.ca

To see how your industry and others are managing workplace hazards and preventing injury, visit the Industry Safety page on worksafeforlife.ca.

Ergonomic Resources

- Worksafeforlife.ca Protecting Your Body

Preventing Violence in the Workplace
To learn about employer obligations and worker rights and responsibilities in the prevention of violence in the workplace, visit: Nova Scotia OHS Division: Workplace Violence Prevention in NS

STF Resources
To learn about how to address slip, trip, and fall hazards in your workplace, visit:

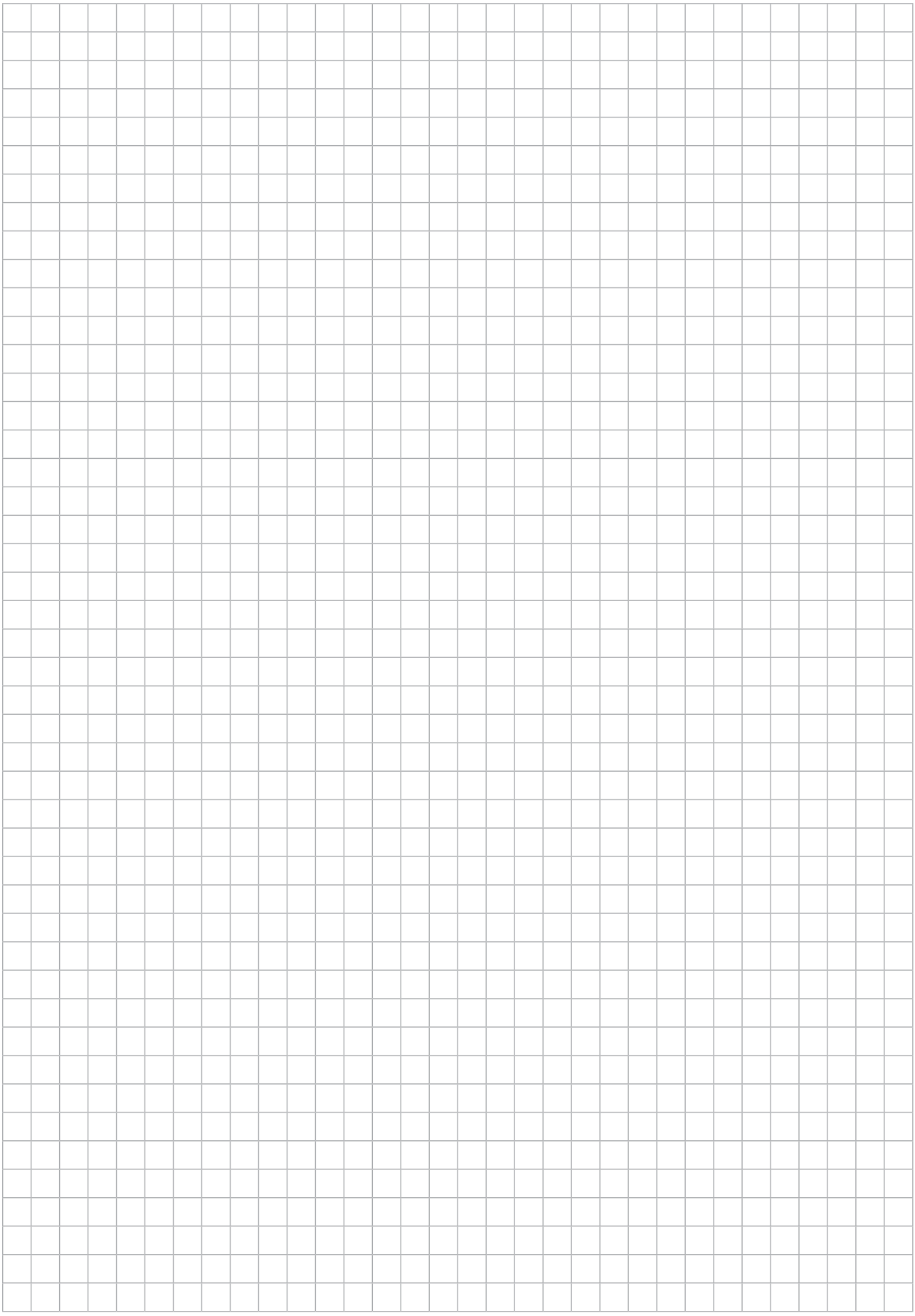
- Slips, Trips, and Falls Employer Resource page on worksafeforlife.ca
- CCOHS: Prevention of Slips, Trips & Falls

MSI Resources
http://www.worksafeforlife.ca/Home/Injury-Prevention/Protecting-your-Body/Musculoskeletal-Injuries

Psychologically Healthy Workplace Resources
http://www.worksafeforlife.ca/Home/Prevention-Education/Protecting-Your-Body/Psychologically-Healthy-Workplaces

Appendix

Sketch Map Sheet Location: _____ Created By: _____



Area Prioritization Worksheet – Option 1

Area/ Location	Total # of Incidents	# Time Loss (TL)	TL Score (# of TL x 10)	# Med Aid	MA Score (# of MA x 5)	# First Aid or Report Only	FA or RO Score (# of FA or RO x 1)	Total Score (TL Score + MA Score + FA or RO Score)	Priority

Hazard Prioritization Worksheet – Option 2

Area/ Location	Hazard	Previously Identified (Y/N)	Control Measures Not in Place (Y/N)	Exposed During Regular Operations (Y/N)	Previous Incidents (Y/N)	Total Score (# of Y)	Priority (1-4)

Hazard Identification and Control Worksheet

Area/Location	Hazard	Control

Hazard Control Action Plan

Area/ Location	Brief Description of Hazard	Brief Description of Control	Person Responsible	Date to be Completed	Status

Inspection Areas with hazards to look for and possible controls

Areas to Inspect	Possible Hazards	Possible Controls
Machinery/Equipment	• Oil/Fluid leaks • Missing guarding • Frayed electrical cord in wet area	• Clean up spill, apply absorbent material and repair machinery to fix leak • Replace missing guards and educate staff on importance of not removing guards • Replace frayed electrical cord • Consider installing electrical drops from celling
Walking surfaces (inside and outside)	• Wet floor • Frayed or lifted carpets • Cords across walkways • Potholes • Ice/snow	• Clean up spills and use wet floor signage • Tape down carpet • Reroute cords • Secure cords • Fill in potholes • Clear ice and snow • Provide salt/sand
Steps, stairs, ladders	• Missing/broken hand rails • Slippery surface • Broken or damaged stair treads • Missing safety feet on ladder	• Repair/replace hand rail • Apply antislip surface • Repair broken stair treads • Take ladder from service • Develop a ladder inspection process
First Aid Equipment	• First aid kits not fully stocked	• Inspect and restock first aid kits monthly • Track usage on first aid incident report
Clothing/Footwear	• Inadequate treads • No safety glasses	• Ensure proper tread and footwear type for the job being performed • Wear safety glasses when using machinery that it is required according to your Safe Work Procedures
Emergency Lights	• Emergency light in hallway burnt out	• Replace emergency light • Monthly inspection to identify inoperative equipment
Behaviour	• Improper lifting techniques • Failure to use assisting tools when moving loads • Rushing	• Bend at legs not back and ask for assistance when load is to heavy • With heavy loads use dolly or push cart • Give yourself enough time to complete a task to avoid the need to rush
Chemicals		• Put labels on all controlled chemicals and store to directions in Safety Data Sheet.

Notes

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