

# Health & Safety Manual

2021

3<sup>rd</sup> Edition



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## Health and Safety Policy

2021

4<sup>th</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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2.0	Oct. 31 <sup>st</sup> , 2019	Olena Vynnychuk	Review
3.0	Jan. 3 <sup>rd</sup> , 2020	Nataliya Muriy	COR-based
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## Health and Safety Policy

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the Occupational Health and Safety Act, and all associated regulations and agreements.

All members of management, the Health and Safety Representative (HSR), supervisors and all workers must come together in making health and safety an integral component of our daily activities, providing timely feedback on policy implementation. We strive to control or eliminate all reasonably foreseeable hazards that may result in accidents/incidents, personal injuries/illnesses, fires, security loss or other property damage.

### **Safety – Everyone's Priority**

Managers: All managers are responsible and accountable for ensuring that health and safety requirements are incorporated into all aspects of our business, since all our employees have the right to work in a safe and healthy work environment. Managers will ensure resources are made available for the successful implementation of all required health and safety processes and programs.

Supervisors: All supervisors are responsible and accountable for ensuring the execution and enforcement of health and safety requirements/processes, health and safety education programs, and written safe work practices and procedures, as applicable in the work areas under their direction. Supervisors must familiarize all the workers with this policy and make sure it is available for consultation at any time.

Employees: All employees are responsible and accountable for safely performing their work in accordance with written requirements/procedures and practices made available to them, reporting any hazards or injuries, participating in health and safety education programs, and protecting their fellow employees. All employees are expected to follow the safe work practices established by management.

Contractors, sub-contractors, external personnel, visitors: All contractors, sub-contractors, agency-supplied personnel and visitors will be expected to abide by all applicable health and safety requirements/processes and established workplace rules.

Health and safety are key to our success and viability.

Sincerely,

Boris Gopka  
Executive Director

Date:



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## **Hazard Assessment, Analysis and Control**

2021

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## Hazard Assessment, Analysis and Control Policy

At Joint Seal Waterproofing, the health and safety of our employees is our number one priority. We continuously strive to protect our employees from injury or occupational disease. We are making every effort to provide a safe and healthy work environment.

Hazard assessment and analysis are at the core of our efforts to maintain a healthy and safe environment for our employees. They are done for each jobsite to ensure the safety of every single employee. Work areas, job types, and tools used are listed below. Controls for each identified hazard must be written down on the JHA.

### Work area:

Office, warehouse, balconies, garages, elevator pits, hospitals, roofs, stairs, utility rooms, tunnels, maintenance chambers, sidewalks, airport apron surfaces, as well as when driving to job sites using company vehicles.

### Job type:

Crack repair, patching, expansion joint injection, caulking, polyurea membrane application.

### Tool use:

Circular saws, chain saws, portable grinders, power tools, extension cords, propane torch, chipping guns, caulking guns; actions to take when handling defective tools.

### **Purpose**

The purpose of our Job Hazard Analysis is to identify, control or eliminate current (if any) and potential dangers in a job or task.

### **Factors**

Factors to be considered in assigning a priority for analysis of jobs include the following, based on the degree of risk they represent:

- Accident frequency and severity
- Potential for severe injuries or illnesses
- Newly established jobs
- Modified jobs
- Infrequently performed jobs
- Low-risk jobs

### **Responsibilities by role**

#### Managers and supervisors:

Joint Seal Waterproofing managers and supervisors are responsible for conducting and overseeing hazard assessment, to ensure all work is safely planned and executed.

*Managers:*

- Shall approve the hazard assessment, analysis and control procedures and any necessary modifications;
- Review their execution on a regular basis;
- Ensure that the sub-contactors follow all the safe work practices and safe job procedures established by the company, by reviewing any of the following:
  - Clearance certificates and licenses, where applicable
  - Training records
  - Performance reports and complaints, if any
  - Internal feedback

*Supervisors:*

Shall ensure all the hazard assessment, analysis and control procedures are being carried out properly.

Job Hazard Assessment, Analysis, and Control must be carried out regularly – every time work begins on a new jobsite, or conditions on an existing jobsite change – to effectively protect all the employees.

All hazard controls must be implemented immediately, as soon as a hazard is identified. All the employees must be made aware by their supervisors of all the controls being implemented.

Employees:

All employees are responsible and accountable for safely performing their work in accordance with the written procedures and practices made available to them, reporting any actual or potential hazards or injuries, participating in health and safety education programs and protecting their fellow employees.

Sub-contractors:

All subcontractors hired by Joint Seal Waterproofing are responsible and accountable for safely performing their work in accordance with the company's written procedures and practices made available to them, reporting any actual or potential hazards or injuries, and protecting their fellow workers.

**A safe workplace – everyone's responsibility**

Job Hazard Assessment, Analysis, and Control must be carried out regularly, as discussed above, to effectively protect all the employees. All hazard controls must be implemented immediately, as soon as a hazard is identified. All the employees must be made aware by their supervisors of all the controls being implemented. Ensuring safe and healthy work conditions is everyone's responsibility!

Sincerely,

Boris Gopka  
Executive Director

Date:



## Job Hazard Assessment (JHA)

Complete this form before the start of each task or with any change in conditions.

Job: \_\_\_\_\_ Date: \_\_\_\_\_

Review the following with the work crew. List tasks and hazards, and identify controls.

High-risk tasks need a Safe Operating Procedure.

### Personal Hazards

- ☐ clear instruction provided
- ☐ able to perform the task
- ☐ trained to use equipment/tools
- ☐ distractions in the work area
- ☐ working alone
- ☐ aware of weather conditions
- ☐ noise levels
- ☐ have all the correct PPE

### Activity Hazards

- ☐ welding/grinding
- ☐ burn/heat sources
- ☐ compressed gasses
- ☐ energized equipment
- ☐ electrical cords condition
- ☐ equipment/tools inspected
- ☐ lockout procedure in place
- ☐ airborne particles

### Environmental Hazards

- ☐ spill potential
- ☐ climatic conditions
- ☐ MSDS reviewed
- ☐ ventilation required
- ☐ heat stress/cold exposure
- ☐ other workers in the area
- ☐ lighting levels
- ☐ housekeeping

### Ergonomic Hazards

- ☐ working in a tight area
- ☐ parts of body in the line of fire
- ☐ working above your head
- ☐ pinch points identified
- ☐ working without being trapped
- ☐ repetitive movements

### Working at Height Hazards

- ☐ barricades, flagging, and signs
- ☐ hole coverings in place
- ☐ protection from falling items
- ☐ powered platforms
- ☐ fall arrest
- ☐ ladders

### Access/Egress Hazards

- ☐ scaffold inspected and tagged
- ☐ slip/trip potential identified
- ☐ required permits in place
- ☐ excavations
- ☐ confined space
- ☐ other

Identify and prioritize tasks and hazards, then identify plans to eliminate or control the hazards.

TASK	HAZARD*	CONTROL

\*All hazards must have action plans to eliminate or control them. Plans must be in place before starting a task.

Name: \_\_\_\_\_ Name: \_\_\_\_\_ Name: \_\_\_\_\_

Name: \_\_\_\_\_ Name: \_\_\_\_\_ Name: \_\_\_\_\_

Name: \_\_\_\_\_ Name: \_\_\_\_\_ Name: \_\_\_\_\_

Supervisor Signature: \_\_\_\_\_ Reviewed by: \_\_\_\_\_



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# Safe Work Practices

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## Safe Work Practices

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have prepared a series of documents outlining safe work practices to promote occupational health, identifying and controlling/eliminating hazards. Pertinent documents are available on each type of equipment and potential hazard, as applicable to Joint Seal's jobsites.

### Safe work practices

- Occupational health
- Work hazards, including fall protection
- Equipment
- Tools
- Traffic control

For each safe work practice, there is a corresponding safe job procedure, as outlined in Joint Seal's Safe Job Procedures manual.

### Responsibilities by role

#### Managers:

All managers are responsible and accountable for the following, to achieve the successful implementation of all required safe work practices:

- Ensuring resources are made available (a hard copy at the office and at jobsites).
- Ensuring that the practices are understood by workers (new employee orientation, safety talks, written acknowledgement).
- Ensuring that safe work practices are incorporated into all aspects of our business by all employees (review of supervisor checklists and employee observation).
- Participating in health and safety education programs.
- Overseeing the development and review of the existing safe work practices.

#### Supervisors:

All supervisors are responsible and accountable for the following:

- Ensuring the enforcement of all safe work practices, as applicable in the work areas under their direction.
- Ensuring that safe work practices are incorporated into all aspects of our business by all employees (regular employee observation and checklist documentation).

- Protecting their fellow employees.
- Participating in health and safety education programs.
- Participating in the development and review of the existing safe work practices.

Employees:

All employees are responsible and accountable for the following:

- Safely performing their work in accordance with written safe work practices and safe job procedures.
- Reporting any hazards (real or potential) or injuries, and protecting their fellow employees.
- Participating in health and safety education programs.
- Participating in the development and review of the existing safe work practices.

Contractors, sub-contractors, visitors:

All contractors, agency-supplied personnel and visitors will be expected to abide by all applicable safe work practices and established workplace rules.

All members of management, the Health and Safety Representative (HSR), and all workers must come together in making health and safety an integral component of our daily activities.

Health and safety are key to our success and viability.

Sincerely,

Boris Gopka  
Executive Director

Date:

## I. Safe Work Practices – Occupational Health

### Manual Lifting

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when manually lifting and moving heavy loads. Injuries may occur regardless of the weight of the object or the physical condition of the person doing the lifting, if proper precautions are not taken.

#### **Safe practices to follow to when lifting heavy objects/loads:**

1. Each worker should be aware of his/her physical limitations as well as the approximate weight of materials.
2. Safe job procedure on manual lifting must be followed (see JSW Safe Job Practices, 2020 edition).
3. Pipes, conduit, reinforcing rods and other conductive materials should not be carried on the shoulder near exposed live electrical equipment or conductors.
4. Be aware of hazardous and unsafe conditions.
5. Power equipment or mechanical lifting devices should be used where practical.



## Hazardous Materials

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed any time flammable liquids must be transported and handled.

For detailed information on a specific material, please refer to our MSDs booklet.

### Transporting Flammable Liquids

1. Gasoline and other highly flammable liquids shall never be carried in the passenger compartment of a vehicle.
2. Approved containers with a CSA or ULC label must be used for transporting and storing gasoline and other highly flammable liquids.
3. Ensure that the containers are not damaged, and that caps or fittings are properly secured after the containers have been filled.
4. Flammable liquids must be transported in an upright position, secured to prevent overturning.
5. When transporting gasoline or other flammable liquids in a van, the containers shall be placed in the rear of the van, with adequate ventilation. Containers must be removed from the van immediately upon arrival.
6. A 5BC fire extinguisher must be provided to the driver and stored in the driver's compartment when gasoline or other flammable liquids are transported in a van.
7. Gasoline is not to be used as a cleaner.
8. Gasoline engines should be shut off and allowed to cool before refuelling.

### Propane

1. Unless designed for horizontal use, propane cylinders must be kept in an upright position.
2. Propane cylinders must be stored in a well-ventilated area away from heat sources, outdoors and above grade.
3. Only approved hoses and fittings must be used to connect a cylinder to tools and equipment.
4. When not in use, propane cylinders and hose-connected devices must not be left in trenches or other low-lying areas. Propane is heavier than air and can settle in dangerous concentrations at

the bottom of trenches, maintenance chambers, vaults, basements, sumps and other below-grade areas.

5. Never look for leaks in a propane cylinder or hose with a flame. Use soapy water.

### Workplace Hazardous Material Information System

To ensure the safety of all the employees and to prevent injuries, the company has the Workplace Hazardous Material Information System (WHMIS) program in place.

#### **Employee training/Instruction**

All employees will receive WHMIS training as required under current legislation. A record of this training must be maintained.

#### **Material Safety Data Sheets**

Responsibility for MSDS is as follows:

##### Senior management:

- a) Review in conjunction with the supervisor all company supplied material with the objective of obtaining all the MSDs required
- b) Obtain from the supplier any MSDSs which are required
- c) Obtain from subcontractors any MSDSs which are required for material supplied by subcontractors
- d) Cooperate with the owner/general contractor in setting up a general MSDS file for the project
- e) Ensure supervisors have set up and updated MSDS filing system on site
- f) Request any labels that may be required

##### Supervisors:

- a) Ensure that there is an MSDS for controlled products used on the site and in the site file which is accessible to all workers
- b) Review all company supplied material and obtain all MSDS required
- c) Make available "upon request" MSDS to all company employees
- d) Ensure that proper personal protective equipment is available on site

## Hearing Protection

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed any time there is exposure to noise that can potentially cause temporary or permanent hearing loss.

### Hearing Loss - Definition

Hearing loss is defined as any reduction in the normal ability to hear. It can be either temporary or permanent.

- Temporary hearing loss: It occurs when hair cells in the inner ear have been bent by vibrations and need time to bounce back. Normal hearing will normally return after a rest period away from all sources of intense or loud noise. The recovery period may be minutes, hours, a day or perhaps even longer.
- Permanent hearing loss: Also referred to as permanent threshold shift (PTS), it can range from slight impairment to nearly total deafness. It is the result of hair cell or nerve destruction within the inner ear. Once nerves are destroyed, they can never be restored or regenerated.

### Hearing Loss Factors

Type of noise	Continuous, intermittent, impact, high or low frequency.
Intensity of noise	Level of loudness.
Duration of exposure	Length of time worker subjected to noise: during any given shift.
Employment duration	Years worker subjected to noise.
Type of noise environment	Character of surroundings: enclosed, open, reflective surfaces.
Source distance	Distance of worker from noise source.
Worker's position	Position of worker relative to noise source.
Worker's age	A 20-year-old vs. a 50-year-old.
Individual susceptibility	Sensitivity difference, physical impairments.
Worker's present health	Whether a worker has any detectable losses or ear diseases.
Home and leisure activities	Exposures to noise other than occupational: hunting, earphone music, snowmobiling, etc.

## Training

All workers who wear Hearing Protection Devices (HPDs) must be trained to fit, use, and maintain them properly. Workers must be trained to fit HPDs properly, as recommended by the manufacturer. Training should include a demonstration. Workers should then practice using the HPDs under close supervision. Checks are needed to ensure the best possible protection.

Workers should understand the following:

- There is risk of hearing loss increases if HPDs are not worn in noisy environments (eight-hour exposure of 85 dBA).
- Wearing HPDs is required in all situations where noise exposure may damage hearing.
- To be effective, an HPD must not be removed even for short periods.
- A variety of HPDs is available to accommodate differences in ear canal size, jaw size, head size and shape, comfort level, compatibility with other forms of Personal Protective Equipment (PPE), etc.
- HPDs must fit properly to achieve maximum protection.

## Choosing the Correct Hearing Protection

CSA Standard Z94.2, Hearing Protectors, identifies classes of hearing protectors as A, B, and C. Class A protectors offer the highest ability to attenuate noise, followed by B and C.

Use Table 1 to identify proper hearing protectors based on noise.

**Recommended Class of Hearing Protector**

Table 1

MAXIMUM NOISE LEVEL (dBA)	RECOMMENDED CLASS OF HEARING PROTECTOR
Less than 85 dBA	No protection required
Up to 89 dBA	Class C
Up to 95 dBA	Class B
Up to 105 dBA	Class A
Up to 110 dBA	Class A plug + Class A or Class B muff
More than 110 dBA	Class A plug + Class A or Class B muff and limited exposure

Use Table 2 to compare typical construction noise levels with the work you are performing.

**NOTE:** If more than one activity is being performed near the same location, the noise levels will increase. Chose your protection based on the highest noise levels.

### Typical Noise Level Measurements for Construction

Table 2

* EQUIPMENT	NOISE LEVEL (DBA) AT OPERATOR'S POSITION
Cranes	78 – 103
Backhoes	85 – 104
Loaders	77 – 106
Dozers	86 – 106
Scrapers	97 – 112
Trenchers	95 – 99
+ Pile drivers	119 – 125
Compactors	90 – 112
+ Explosive-actuated tools	120 – 140
Grinders	106 – 110
Chainsaws	100 – 115
Concrete saw	97 – 103
Sand blasting nozzle	111 – 117
Jackhammers	100 – 115
Compressors	85 – 104

\* Generally, newer equipment is quieter than older equipment. (For noise levels of specific equipment, contact the Construction Safety Association of Ontario.)

+ Pile drivers and explosive-actuated tools generate intermittent or “impulse” sound.

## Dust

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when dust is generated.

Safe work practices include two types of preventative measures: ventilation and respiratory protection.

### **Where does construction dust come from?**

Dusts are particles which are usually many times larger than fume particles. Dusts are generated by crushing, grinding, sanding, or cutting and by work, such as demolition.

### **Preventative Measures**

Ventilation:

- Natural dilution ventilation — Working outside in a light breeze, or inside with doors and windows open normally provides sufficient ventilation capable of dispersing airborne contaminants.
- Mechanical dilution ventilation – Fans, such as portable exhaust fans and wall fans, force outside air into and out of the building.
- Local exhaust ventilation – Such systems consist of an exhaust fan, air cleaner, and ducted system dedicated to removing airborne contaminants at the source and exhausting them outdoors.

Respiratory Protection:

- Consult the Respirator Selection Guide in CSAO's *Construction Health and Safety Manual* (M029) for activities that create dust and the appropriate Personal Protective Equipment (PPE).
- Supervisors should be consulted when in doubt about choosing the correct respiratory protection.

## Cleaning Solvents and Flammable Liquids

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed any time flammable liquids or toxic solvents are used. Whenever possible, solvents should be non-flammable and non-toxic.

The supervisor must be aware of all solvents/flammables that are used on the job and be sure that all workers who use such materials have been instructed in their proper use and any hazard they pose.

### **Practices to follow to ensure safety:**

1. Use non-flammable solvents for general cleaning.
2. When flammable liquids are used, make sure that no hot work is permitted in the area.
3. Store flammables and solvents in special storage areas.
4. Check toxic hazards of all solvents before use (MSDS).
5. Provide adequate ventilation where all solvents and flammables are being used.
6. Use goggles or face shields to protect the face and eyes from splashes or sprays.
7. Use rubber gloves to protect the hands.
8. Wear protective clothing to prevent contamination of worker's clothes.
9. Use the appropriate respiratory protection when breathing hazards exist.
10. Never leave solvents in open tubs or vats. Return them to storage drums or tanks.
11. Ensure that proper containers are used for transportation, storage and the field use of solvents/flammables.
12. Where solvents are controlled products, ensure that all employees using or in the vicinity of use or storage are trained in the Workplace Hazardous Materials Information System (WHMIS).
13. Ensure all WHMIS requirements are being met.

## II. Safe Work Practices – Hazard

### Access and Egress

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when accessing or egressing work sites.

#### **Steps to follow to ensure safety:**

1. There must be adequate lighting in areas of access and egress.
2. If material may fall on a worker, overhead protection must be provided.
3. Access to and egress from a work area located above or below ground level shall be by stairs, runway, ramp or ladder.
4. Areas of access and egress must be unobstructed.
5. Areas of access and egress must be kept clear of snow, ice, or other slippery material.
6. Areas of access and egress shall be treated with sand or similar material, when necessary, to ensure a firm footing.
7. Every shaft shall have a means of access and egress by stairway, ladder, or ladderway for its full depth during construction and when it is completed.
8. A cage or car on a hoist used for transporting workers in a shaft shall have the following characteristics:
  - Be designed by a professional engineer and built in accordance with the design drawings;
  - Be at least 1.8 metres high;
  - Be solidly enclosed, except for openings for access and egress;
  - Have a maximum of two openings for access and egress;
  - Have a gate at each opening for access and egress; and
  - Have a protective cover suitable to protect passengers from falling objects.



## Electrical Safety

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when working with or near electrical devices, as accidental contact with electrical components can be deadly.

### **Steps to follow to ensure safety when using new electrical appliances, tools and equipment:**

1. All electrical tools and appliances will be double insulated or have a three-prong plug-in.
2. All electrical appliances, tools and equipment must be serviced and repaired only by qualified and authorized electricians.
3. Ensure the work surface is dry before operating electrical-powered tools and equipment.
4. Tools with damaged cords, grounds and housing units are to be tagged "Out of Service" and sent for repair.
5. Missing or damaged ground plugs of any appliance, tool or piece of equipment must be repaired before use.
6. Damaged extension cords shall be tagged "Out of Service", repaired or replaced as warranted.
7. Always stand to the side of a service box when resetting a breaker.
8. All electrical tools must be C.S.A. approved.
9. Disconnect power tools from power source before making adjustments.
10. Tools with electrical arcing brushes should be removed when the worker feels any tingling during use.

## Fire and Fire Extinguishers

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed in case of fire and when operating fire extinguishers.

Since fire can start anywhere, it is essential to know which type of fire extinguisher to use and how to use it. Fire extinguishers must be easily accessible and properly maintained.

Workers must receive training before using such equipment.

### Types of Fires

1. **Class A:** Wood, paper, rags, rubbish and other ordinary combustible materials.
  - **Recommended Extinguishers:** Water from a hose, pump-type water can, pressurized extinguisher, or soda acid.
  - **Fighting the Fire:** Soak the fire completely – even the smoking embers.
2. **Class B:** Flammable liquids, oil and grease.
  - **Recommended Extinguishers:** ABC units, dry chemical, foam and carbon dioxide.
  - **Fighting the Fire:** Start at the base of the fire and use a swinging motion from side to side, always keeping the fire in front of you.
3. **Class C:** Electrical equipment.
  - **Recommended extinguishers:** Carbon dioxide and dry chemical (ABC units).
  - **Fighting the Fire:** Use short bursts on the fire. When the electrical current is shut off on a Class C fire, it can become a Class A fire if materials around the electrical fire are ignited.

## Housekeeping

To ensure the safety of all the employees and to prevent injuries, the workplace must be kept clean. All employees, contractors and subcontractors are required to contribute to workplace safety.

### **Practices to follow to ensure safety:**

1. Tripping hazards and slippery conditions must be eliminated. Aisles and access ways must be well-lit, properly ventilated, and kept clear of any obstruction.
2. Keep exterior walkways and stairways free of snow, ice and obstacles.
3. Watch for hazards, such as nails, pieces of scrap metal, grease and oil.
4. Clean up spills promptly with proper absorbing materials and agents.
5. Place different types of garbage in appropriate containers.
6. Store all oily rags in appropriate fire-approved steel containers.
7. Materials must be properly stored, stacked or piled away from power lines and to prevent tipping/spilling.
8. Bagged or sacked material should be stacked or piled no more than ten high and should be cross piled on skids so that in all cases, no one can be injured because the material falls, rolls, overturns or breaks.
9. Barrels may be stacked upright with platforms/planks between layers and should not be stacked any higher than the mechanical equipment can safely reach.
10. Skids of brick blocks or other such material should be stockpiled in such a manner as to prevent tipping or collapsing.
11. Signs must be posted to warn workers of hazardous areas.

## Tagging and Lockout

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed to ensure proper tagging and lockout.

### Practices to follow to ensure safety:

1. Review drawings of the system to be de-energized and de-activated to determine the switches, power sources, controls, interlocks, or other such devices necessary to isolate the system. Confirm with the client/owner where required.
2. All apparatus capable of being electrically energized or dynamically activated must be de-energized or de-activated by locking out, ensuring the device cannot be operated.
3. Test the system with a CSA-certified potential test indicator to ensure that all components are de-energized and de-activated, including interlocking or dependent systems which could feed into the system being isolated, whether mechanically or electrically. Potential test indicators should not be used beyond the voltage limits for which they are rated.
4. The following safeguards for locking out and tagging must be observed:
  - a) After the circuit has been de-energized, locked out by the person in charge, workers must be protected by personally placing their own safety lock on the disconnect switch. The worker must retain the key for this lock while the lock is in place.
  - b) Where several workers or trades are working on the circuit, provision for additional locks must be made through the use of a lockout bar. This arrangement can accommodate any number of locks by placing another lockout bar in the last hole of the previous bar.
  - c) In accordance with Section 190(6)3. of the current *Regulations for Construction Projects* (O.Reg. 213/91), each worker must attach to their lock a durable tag filled out with the following information:
    - Reason why the equipment was disconnected;
    - Name of person responsible for the disconnection and his/her employer; and
    - Date on which the equipment was disconnected.
  - d) The de-energized electrical system must be discharged by short circuit and phase to ground. A temporary ground cable must be attached to the system and remain in place until work is completed.

5. A record must be kept of the devices opened, locked out or otherwise rendered inoperable so that all of these devices can be reactivated once work is complete.
6. Place signs on the system indicating that it is not to be energized or operated and that guards, locks, temporary ground cables, chains, tags, and other safeguards are not to be tampered with or removed until work is complete.
7. Workers testing electrical equipment must:
  - Remove all watches, rings, neck chains or other current-conducting jewelry;
  - Wear electric shock resistant footwear; and
  - Wear safety glasses with side shields.

## Trenches and Excavation

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed to ensure safe trenching and excavation.

Since soil conditions and stability can vary, different factors must be kept in mind: type of soil, previously disturbed soil, drying of walls and sub-surface weeping.

### **Factors to consider based on soil type:**

#### Hard Compact

Hard compact is defined as:

- Hard to hand excavate,
- an excavating bucket can leave well defined teeth marks in the soil,
- the soil has been verified as hard compact by a Professional Engineer,
- a soil testing kit indicates that it is hard compact.

#### Soils Other than Hard Compact

1. Require a 45 degree or greater cutback from the vertical side wall in all soil conditions above 1.2 meters in height.
2. Require the use of shoring, or
3. Require the use of an engineered trench box.

#### Frozen Soils

Frozen soils cannot be considered hard compact due to the risk of wall failure below the frost line.

#### Setbacks

Trenches in or near roadways and construction sites are subject to wall movement from vibration. Vehicles and equipment must be kept back from the trench a distance equal to the depth of the trench.

#### Spoil Piles

1. They must be set back a minimum of 1.0 m from the trench/excavation edge.
2. If placed too close to the trench or excavation edge, they can exert excess downward pressure causing wall failure.
3. Excavated loose material should be scaled back away from the edge of the trench.

*For further information, see the appropriate current Occupational Health & Safety Legislation.*

### **Practices to follow to ensure safety:**

1. All earth trenches more than 1.2 metres (4 feet) deep that a worker is required to enter, must be shored with timbers or a pre-fabricated trench box or supported by an approved support system in

accordance with the current *Regulations for Construction Projects*, or be cut with embankment slopes of 1 to 1 (45 degrees).

2. Ladders must be used for getting into or out of a shored trench and be placed so that a worker is protected at all times when using the ladder.
3. Work must not be performed in a trench unless another worker is working above ground in close proximity to the trench or to the means of accessing it.
4. Buried services, such as gas lines, water lines, sewers and electrical services must be located and marked before excavation starts.
5. When timber shoring is used, it must be installed progressively as the trench is being excavated.
6. Excavations which workers are required to enter must be kept reasonably free of water.

Tools, equipment and excavated soil must be kept at least 1 metre (3 feet) from the edge of the excavation or trench.

## Welding, Cutting, and Burning

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed any time welding, cutting, and burning are necessary. Such work can create fires and breathing hazards for workers on any job.

### **Practices to follow to ensure safety:**

1. Adequate ventilation must always be supplied, since hazardous fumes can be created during welding, cutting or burning.
2. Where other workers may also be exposed to the hazards created by welding, cutting and burning, they must be alerted to these hazards and protected by the use of “screens”.
3. Never start work without proper authorization.
4. Fire fighting equipment must be kept on hand before starting.
5. Check the work area for combustible material and possible flammable vapours.
6. A welder should never work alone – a fire or sparks watch should be maintained.
7. Protect cables and hoses from slag or sparks.
8. Never weld or cut lines, drums, tanks, etc. that have been in service without making sure that all have been purged or other necessary precautions are in place.
9. Never enter, weld or cut in a confined space without proper air quality testing and a qualified safety lookout in place.
10. When working overhead, use fire resistant materials (blankets, tarps) to control or contain slag and sparks.
11. Cutting and welding must not be performed where sparks and cutting slag will fall on cylinders.
12. Open all cylinder valves slowly. The wrench used for opening the cylinder valves should remain on the valve spindle.



## Grinding

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when grinding. Severe injury may occur if guards and proper personal protective equipment are not used and maintained.

### **Safe practices to follow to prevent injuries:**

1. The tool rest must be at the correct distance from the abrasive wheel, maximum 1/8" or 3 mm.
2. The grindstone must be replaced when adjustment of the rest cannot provide 1/8" or 3 mm clearance.
3. Guards must be in place and fully functional.
4. If the wheel has been abused and ground to an angle or grooved, the wheel must be either refaced with the appropriate surfacing tool or replaced.
5. Goggles or a face shield must be used to protect the eyes at all times when grinding.
6. Each time a grinding wheel is replaced, check the maximum approved speed (stamped on the wheel) against the shaft rotation speed of the machine to ensure the safe speed is not exceeded.
7. A grinding wheel must not be operated at speeds exceeding the manufacturer's recommendation.
8. The flanges supporting the grinding wheel should be a maximum of 1/3 the diameter of the wheel and must fit the shaft rotating speed according to the manufacturer's recommendation.
9. Bench grinders are designed for peripheral grinding. No grinding must be done on the side of the wheel.
10. Do not stand directly in front of the grinding wheel when it is first started.
11. CSA-approved hearing protection must be worn.

## Chipping

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when chipping concrete. Severe injury may occur if guards and proper personal protective equipment are not used and maintained.

### **Safe practices to follow to prevent injuries:**

1. Exposure to cement dust should be reduced to the minimum to prevent bronchitis and silicosis by wetting down work areas – when possible – and wearing the corresponding PPE.
2. Concrete surfaces should be wetted, when possible, and local exhaust ventilation installed, to reduce/eliminate dust normally created when chipping with a chipping gun.
3. Appropriate PPE, such as gloves, boots, goggles or HEPA-filter respirators, must be worn.
4. Burns and skin and eye irritation should be prevented by avoiding skin contact and eye contact with cement dust or wet cement.
5. Special HEPA vacuums should be used to clean up dust instead of dry sweeping.

## Caulking

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when caulking, even though it is a mild irritant.

### **Safe practices to follow to prevent injuries:**

1. Old caulking should be removed with care because an injury can occur while using a snap-off retractable utility knife.
2. All debris should be vacuumed.
3. Breaks are recommended when caulking during an extended period of time to let hands and wrists rest from being in an awkward position.
4. To prevent getting caulking on skin, gloves or a popsicle stick can be used to smooth out the caulk joint.

## Expansion Joint Injection

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when injecting expansion joints.

### **Safe practices to follow to prevent injuries:**

1. Supply workers with appropriate safety equipment for performing high-pressure injection of polyurethane resins and associated tasks.
2. Supply safety devices, traffic control barriers, drop sheets and other items to protect the site, other contents and other personnel from contact with the contractors' materials or equipment.

### III. Safe Work Practices – Fall Protection

#### Fall Protection

To ensure the safety of all the employees and to prevent injuries, safe practices must be followed when it comes to fall protection, when applicable.

#### **Working from Scaffolds**

1. Scaffold platforms must be fully planked.
2. Guardrails consisting of a top rail, mid-rail and toe board are required whenever the working platform is 2.4 metres (8 feet) or more above floor level.
3. Wheels and casters must be locked when personnel are working on the scaffold.
4. If the scaffold is more than 2.4 metres (8 feet) high, it must not be moved with personnel on it unless:
  - a. they wear full body harness with lanyard and shock absorber tied off to an independent fixed support, and
  - b. the floor is firm and level.

#### **Working from Ladders**

1. A worker must wear a full body harness with lanyard and shock absorber tied off to either an independent fixed support or a lifeline whenever the worker is:
  - a. 3 metres (10 feet) or more above the floor, or
  - b. above operating machinery, or
  - c. above hazardous substances or objects.

#### **Working Beside Unprotected Openings and Edges**

1. A worker must wear a full body harness with lanyard and shock absorber tied off to an independent fixed support whenever the worker is more than 3 metres (10 feet) above the next level or whenever the worker is above operating machinery, hazardous substances or objects regardless of the possible fall height.

## Fall Protection Equipment

To ensure the safety of all the employees and to prevent injuries, fall protection equipment must be used when working at heights.

### Fall Arrest Protection – Definition

Fall arrest protection consists of a lanyard or lifeline/lanyard set-up; the wearer is allowed some movement at an exposed edge to perform the work. If he/she trips or loses balance, he/she could possibly fall over the edge, so the fall arrest protection must be in place.

### Equipment Standards and Set-Up

1. All safety belts, full body harnesses and lanyards must be C.S.A. certified and carry a C.S.A. label.
2. Safety harnesses and belts are to be snug-fitting and worn with all hardware and straps intact and properly fastened.
3. Lanyards are to be 5/8" diameter nylon or equivalent.
4. The D-rings on the safety belts should be centered on the person's back.
5. The lanyard or lifeline/lanyard combination must be secured to a rigid support capable of resisting the peak arrest forces of 1800 lbs minimum for fall arrest protection purposes. Its length should be adjusted so that the wearer will be prevented from falling more than 1.5 meters from where he/she stands.
6. When the lifeline consists of wire rope, or the connecting lanyard consists of nylon webbing, a shock-absorbing lanyard shall be used.

### **Lifelines and Their Set-Up**

All lifelines shall have the following characteristics:

1. Be 16 millimeters (5/8") diameter polypropylene or equivalent.
2. Be used only by one worker at a time.
3. Be free of any cuts, abrasions, other defects and be protected against chaffing.
4. Be long enough to reach the ground or be knotted at the end.
5. Be connected at right angles to the worker's position.
6. Be provided with a rope grab (cam lever) device for lanyard attachment.

### **Full Body Harnesses, Lanyards, and Shock Absorbers**

1. All full body harnesses, lanyards, and shock absorbers must be CSA-certified and have a CSA label.
2. Full body harnesses must be snug-fitting and worn with all hardware and straps intact and properly fastened.
3. Lanyards must be 16-millimetre (5/8") diameter nylon or equivalent.
4. Lanyards must be equipped with a shock absorber.

### **Rope Grabbing Devices**

1. To attach the lanyard of a full body harness to a lifeline, a CSA-certified mechanical rope grab (with a CSA label) must be used.

#### ***WARNING!***

**No worker shall be exposed to heights greater than three metres when near an unguarded edge to a floor, roof, platform, opening or on a ladder without first providing travel restraint, fall arrest or guardrail protection.**

**Any person found doing so shall be subjected to disciplinary action.**

**Fall protection is also required if a worker may fall into operating machinery, into water or other liquids, into or onto hazardous substances or objects regardless of the minimum three metre ruling.**

## Guardrails

To ensure the safety of all the employees and to prevent injuries, guardrails should be used to aid in fall protection when there is a danger of a worker falling 3 metres or more, or from a lesser height that might involve an unusual risk or injury.

### **Safe practices to follow to ensure safe installation and operation:**

1. Workers installing or removing guardrails above 3 metres will be tied off to prevent falls.
2. Install guardrails no more than 30 cm from an open edge.
3. Ensure guardrail material is free of damage and defect.
4. Support posts should be no more than 2.4 metres (8 ft) apart and securely anchored.
5. All guardrails must be complete:
  - top rail 1 metre above platform;
  - mid rail halfway between top rail and toe board; and
  - toe board 10 cm high and secured to inner side of posts.
6. Posts and rails must be capable of withstanding a force of at least 200 lbs applied at any point.
7. No work begins in the area until guardrails have been inspected by crew lead.

## IV. Safe Work Practices – Equipment

### Company Vehicles

All employees who drive Joint Seal Waterproofing vehicles must hold a valid driver's license applicable to the type of vehicle being operated.

**To ensure safety, never do the following:**

1. Operate a defective vehicle. Report any problems to a mechanic and have it repaired prior to use.
2. Offer rides to anyone other than Joint Seal Waterproofing employees.
3. Allow passengers to ride in the back of a pick-up or any unit that is not equipped with approved seats and restraining devices.
4. Leave the vehicle running and unattended.
5. Smoke inside the vehicle.

**To ensure safe operation:**

Follow Safe Job Procedures as outlined in the corresponding document (Joint Seal's Safe Job Procedures, 2020 edition).

**IMPORTANT:**

- Serious violations of the *Highway Traffic Act*, such as careless driving, may result in termination.
- Operators are responsible for any fines that are levied by a peace officer.

## Ladders

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed.

### Safe practices to follow to ensure safe operation:

1. All portable ladders must be equipped with non-slip bases.
2. Ladders must be set up on a firm level surface. A mud sill must be used if the base of the ladder is on soft, uncompacted or rough soil.
3. Straight ladders will be tied off or otherwise secured to prevent movement. Otherwise, one worker will hold the base of the ladder while it is being used.
4. When a task must be done while standing on an extension ladder, the length of the ladder must be such that the worker stands on a rung no higher than the fourth from the top.
5. When climbing up or down, workers must always face the ladder.
6. Ladders may be set up in passageways, doorways, driveways or other locations where they can be struck or bumped by persons or vehicles, *only* if suitable barricades or other protection has been installed.
7. Ladders must not be erected on boxes, carts, tables, scaffold platforms, elevating work platforms or on vehicles.
8. Straight ladders must be set up at an angle such that the horizontal distance between the top support and the base is not less than one-quarter or greater than one third of the vertical distance between these points.
9. Metal ladders or ladders with wire reinforcing must not be used in the proximity of energized electrical conductors.
10. Wooden ladders must be unpainted or finished with a clear non-conductive wood preservative.
11. All ladders installed between levels must be securely fastened, extend 90 centimetres (3 feet) above the top landing and allow for clear access at top and bottom.
12. Ladders with weakened, broken, bent or missing steps, broken or bent side rails, broken, damaged or missing non-slip bases, or otherwise defective must *not* be used, and must be tagged and removed from the worksite.
13. Ladders must not be used horizontally as scaffold planks, or for any service for which they have not been designed.
14. Workers on a ladder must not straddle the space between the ladder and another object.
15. Three points of contact (two hands and one foot, or two feet and one hand) must always be maintained when climbing up or down a ladder.



## Portable Ladders

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using portable ladders.

### **Safe practices to follow to ensure safe operation:**

1. All portable ladders must be equipped with non-slip bases.
2. When setting up a ladder, the base must be secured and the ladder “walked” into place.
3. The ladder should be set at the proper angle of one foot out at the base for every four feet of height.
4. The ladder must be secured in place, before use.
5. When in position, the ladder should protrude one meter above the intended landing point.
6. Work must not be done from the top two rungs of a ladder.
7. No overreaching is allowed. Workers must climb down and move the ladder over a few feet to a new position.
8. Workers must always face the ladder when using it, ensuring a firm grip by using the three-point contact method (two feet and one hand or one foot and two hands) when moving up or down.
9. The minimum overlap on an extension ladder should be one meter unless otherwise specified by the manufacturer.
10. Metal and wood ladders must be kept away from electrical sources.

## Step Ladder

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using step ladders.

Step ladders must be in good condition and appropriate for the work to be done. Use them only on clean and even surfaces.

### **Safe practices to follow to ensure safe operation:**

1. No work must be done from the top two rungs of a step ladder, counting the top platform as a rung.
2. The step ladder is only to be used in the fully opened position with the spreader bars locked.
3. Tops of step ladders must not be used as support for scaffolds.
4. No overreaching is allowed while working on the ladder. Workers must climb down and move the ladder over.
5. Only construction-grade ladders must be used.

## Scaffolding

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when setting up and using scaffolding.

### **Safe practices to follow to ensure safe operation:**

1. The set-up and dismantling of scaffolds must be carried out under the supervision of a competent and experienced worker.
2. Workers setting up and dismantling a scaffold more than 2.4 metres (8 feet) high must be tied off with a full body harness and lanyard equipped with a shock absorber.
3. Scaffolds must be set up with all braces, pins, screw jacks, base plates, and other fittings installed, as required by the manufacturer.
4. Scaffolds must be adequately braced horizontally and vertically.
5. Scaffolds must be equipped with guardrails consisting of a top rail, mid-rail and toe board.
6. Scaffold platforms must be at least 46 centimetres (18 inches) wide, and if they are over 2.4 metres (8 feet) high, they must be planked across their full width.
7. Scaffolds must be tied into a building at vertical intervals not exceeding three times the least lateral dimension, including the dimension of any outrigger stabilizing devices.
8. Where scaffolds cannot be tied into a building, guy lines adequately secured should be used to provide stability.
9. Scaffold frames must be properly pinned together where scaffolds are two frames or more in height, or where they are used as rolling scaffold towers.
10. Scaffolds must be set up, used and maintained in a reasonably plumb condition.
11. Scaffold planks must be securely fastened to prevent them from sliding.
12. Scaffold planks must be installed so that they overhang by at least 15 centimetres (6 inches) but no more than 30 centimetres (12 inches).

## Elevating Work Platforms

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using elevating work platforms.

### **Safe practices to follow to ensure safe operation:**

1. An elevating work platform must be operated by a worker trained in the machine's operation.
2. Daily inspection must be done, in accordance with manufacturer's instructions.
3. All workers on an elevating work platform must wear a harness and lanyard equipped with a shock absorber at all times, and be tied off to the appropriate fixed point.
4. Elevating work platforms are only to be used on working surfaces for which the machine was designed.
5. Elevating work platforms can be used up to but not exceeding the maximum rated working loads. All loads are to be evenly distributed.
6. No overhanging load is to be lifted on an elevating work platform.
7. All equipment must have working alarms and emergency controls.
8. When an elevating work platform is used to lift materials, the materials must be firmly secured to the platform.
9. No type of makeshift platform (boxes, ladders, scaffolds, etc.) can be placed on an elevating work platform to gain access to areas above.
10. Only an extension device from the manufacturer may be used to extend the platform on an elevating work platform.
11. A gap between elevating work platform and other work areas may not be bridged by planks or other materials.
12. Elevating work platforms shall not be used in high wind conditions.
13. Elevating work platforms shall not be used for pulling, pushing and/or dragging materials.
14. Elevating work platforms must be turned off in an enclosed work area when not in use, to prevent the accumulation of exhaust fumes.

## V. Safe Work Practices – Tools

### Chain Saws

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using chain saws.

Workers must be trained in proper chain saw use.

#### **Safe practices to follow to ensure safe operation:**

1. Proper personal protective equipment is to be worn, as set out by the manufacturer and the Occupational Health & Safety Legislation.
2. Saws must be fuelled in a well-ventilated area and not while running or hot.
3. Refuelling must be done with an approved safety container with approved spout or funnel.
4. The correct methods of starting, holding, carrying, storage and use of the saw – as directed by the manufacturer – must be used.
5. Chain brakes must be checked for proper functioning, to be able to stop the chain when necessary.
6. The chain must be sharp, have the correct tension, and be adequately lubricated.
7. When carrying/transporting a chain saw, the bar guard must be in place, the chain bar must be toward the back, and the motor must be shut off.
8. The chain saw must not be used for cutting above shoulder height.
9. Maintenance must be done according to manufacturer's specifications.
10. Chain saws must comply with CSA Standards Z62.1-03.

## Circular Saws

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using circular saws.

Workers must be trained in proper circular saw use.

### **Safe practices to follow to ensure safe operation:**

1. Approved safety equipment, such as safety glasses or a face shield, must be worn.
2. Where harmful vapours or dust is created, approved respiratory protection must be used.
3. The proper blade, designed for the work to be done, must be selected and used.
4. The power supply must be disconnected before any adjustments to the saw are made, or the blade is changed.
5. Before the saw is set down, the retracting guard must be fully returned to its down position.
6. While sawing, the saw must be held with both hands.
7. Maintenance must be done according to manufacturer's specifications.
8. Ensure all cords are clear of the cutting area before starting to cut.
9. Before cutting, the area must be checked to ensure there are no foreign objects or any other obstruction which could cause the saw to "kick back".
10. When ripping, make sure the stock is held securely in place. A wedge must be used to keep the stock from closing and causing the saw to bind.

## Power Tools

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using power tools. Severe injury may occur if such tools are not used and maintained properly.

### **Safe practices to follow to prevent injuries:**

1. The manual must be read carefully to learn about power tool's applications, limitations and any potential hazards.
2. Unless they are double insulated, tools must be grounded.
3. Power tools must not be used in rain, damp or wet locations, or in the presence of explosive atmospheres (gaseous fumes, dust or flammable materials).
4. Materials or debris that may be ignited by sparks must be removed.
5. Work area must be kept clean and well lit.
6. No loose clothing or jewelry may be worn.
7. Protective hair covering to contain long hair, which may be caught in moving parts, must be worn.
8. Rubber gloves and insulated non-skid footwear outdoors must be worn.
9. Hands must be kept away from moving parts.
10. Safety goggles or glasses with side shields that comply with current safety standards must be worn.
11. Hearing protection must be worn during extended use of a power tool.
12. A dust mask must be worn during dusty operations.
13. Other personal protective equipment must be worn, as required.
14. A fire extinguisher must be kept nearby.

15. All bystanders must be kept at a safe distance from the work area to protect themselves and the operator.
16. Barriers or shields must be provided, as necessary, to protect others in the work area from sparks and debris.
17. Work must be secured with a clamp, vise or other practical means of holding work secure. Both hands must be used to control the tool.
18. Tools or attachments must not be used to do jobs they were not designed for. Tools must not be altered.
19. Non-recommended accessories may be hazardous and shall not be used.
20. A guard or other safety device must not be defeated when installing an accessory or attachment.
21. Guards and other parts must be inspected before use. Misalignment, binding of moving parts, improper mounting, broken parts and any other condition that may affect operation must be checked for.
22. In case of any abnormal noise or vibration, the tool must be turned off immediately and the problem corrected before using the tool further.
23. All adjusting keys and wrenches must be removed from the tool before the power is turned on.
24. Body contact with grounded surfaces, such as pipes, radiators, ranges and refrigerators, must be prevented.
25. When blind or plunge cuts are made, the work area must be checked for hidden wires or pipes.
26. Tools must be held by insulated non-metal grasping surfaces.
27. Ground Fault Circuit Interceptor (GFCI) must be used to reduce shock hazards.
28. A tool should not be forced to perform at a rate other than for what it was designed.
29. Hands must be kept away from all cutting edges and moving parts.

30. A tool must not be carried by its cord or be unplugged by yanking the cord from the outlet. The plug must be used for pulling the cord, to reduce the risk of damage.
31. The cord must be kept away from heat, oil, sharp objects, cutting edges and moving parts.
32. No overreaching is allowed. Proper footing and balance must always be maintained. Extra care must be exercised when using tool on ladders, roofs, scaffolds, etc.
33. Power tools must not be used when a worker is tired, distracted or under the influence of drugs, alcohol or any medication which decreases control.
34. The tool must be unplugged when not in use, before accessories are changed or recommended maintenance is performed.
35. Tools must be maintained properly. Handles must be kept dry, clean and free from oil and grease. Cutting edges must be kept sharp and clean. Instructions for lubricating and changing accessories must be followed.
36. Tool cords and extension cords must be periodically inspected for damage.
37. When power tools are not in use, they must be stored in the proper storage cases. If equipment does not have a proper storage case, it must be stored in an on-site job box with lock or returned to storage crib at the shop.
38. Any damaged tools must be reported immediately to ensure replacement or repair can be done. The damaged tools must be labeled with "DO NOT USE".
39. All labels and nameplates must be maintained.



## Propane Torch

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using propane torches.

Workers applying torch on products can receive serious burns from the torch flame (due to the temperatures reaching over 1093°C).

### **Safe practices to follow to ensure safe operation:**

1. When using a torch, workers must wear additional protective clothing (gloves, eye protection).
2. Torching equipment must be in good working condition, and the cylinder valves must be clean. Fittings, hoses and heads must be checked.
3. Defective equipment must NEVER be used.
4. Soapy water should be used to check connections for leaks.
5. Only a spark lighter or electronic starter must be used for lighting the torch.
6. Propane hose must be protected from damage with the following actions:
  - Keeping torch flame away from hose.
  - Keeping hose free of kinks.
  - Not running over hose with equipment.
  - Not using the hose to lift the cylinder.
7. A torch flame is difficult to see in daylight, so extra care must be taken to keep away from the flame.
8. Other than the operator, all workers should stay at least 1 metre away from the torch.
9. Torch units must be set into support leg position when not in use.
10. To shut off torch, close cylinder valve first, let gas burn out, and then close torch valve.
11. At the end of the day, hoses must be disconnected and stored properly.
12. AN OPERATING TORCH MUST NEVER BE LEFT UNATTENDED.

## Portable Grinders

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using portable grinders. Severe injury may occur if abrasive wheels are not properly stored, used and maintained.

### **Safe practices to follow to prevent injuries:**

1. Grinder operator must be trained in using this tool.
2. Proper guards must be in place.
3. The maximum wheel speed RPM, as indicated on each wheel, must never be exceeded.
4. The speed marked on the wheel must be compared to the speed marked on the grinder.
5. When installing the wheel, it must be checked for cracks and defects. Mounting flanges must be clean, and the mounting blotters must be used. The mounting nut must not be overtightened.
6. Before grinding, the newly mounted wheel must be run at operating speed, to check for vibration.
7. Grinders must not be used near flammable materials.
8. Grinders must not be used for jobs they were not designed for, such as cutting.
9. CSA-approved personal protective equipment must be worn (including eye, face, hand, foot, and hearing protection).

## Extension Cords

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using extension cords.

### **Safe practices to follow to ensure prevent injuries:**

1. All portable extension cords must be of the outdoor type, rated for 300 volts, and have an insulated grounding conductor.
2. All extension cords must be CSA approved and inspected before use.
3. Defective cords must not be used. They must be tagged and removed from the worksite until repaired.
4. Extension cords must be protected during use to prevent damage from sharp edges, movement of materials, and flame cutting.
5. All extension cords used in hazardous areas or in damp locations are to be protected by approved ground fault devices.

## Defective Tools

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when handling defective tools.

If a tool is defective in some way, DO NOT USE IT, to avoid injury.

### Safe practices to follow to ensure safety:

Issues to be aware of:

- chisels and wedges with mushroomed heads;
- split or cracked handles;
- chipped or broken drill bits;
- wrenches with worn-out jaws;
- incomplete tools (files without handles, etc.);
- broken or inoperative guards;
- insufficient or improper grounding due to damage on double insulated tools;
- no ground wire (on plug) or cords of standard tools;
- the on/off switch not in good working order;
- tool blade is cracked; and
- the wrong grinder wheel is being used, or the guard has been wedged back on a power saw.

To ensure safe use of hand tools, the following must be done:

1. a defective tool must never be used;
2. all tools must be checked prior to use; and
3. all defective tools must be repaired.

To ensure safe use of air, gasoline or electric power tools:

1. tools must be in good condition;
2. tools must not be used if defective in *any* way; and
3. tool operator must be trained and attentive during use.

### IMPORTANT!

**All defective tools must be removed from the work area and each one marked as**

**“DEFECTIVE – DO NOT USE.”**

## VI. Safe Work Practices – Traffic Control

### Mobile Equipment

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when using mobile equipment to reduce the risk of personal injury.

Field workers must always be aware of mobile equipment operating in the area.

#### **Safe practices to follow to reduce risk:**

1. A florescent traffic vest must always be worn.
2. Any worker near such equipment must be visible to the operator.

#### **The following must NEVER be done:**

1. Walking next to, in front of, or behind mobile equipment that is operating.
2. Positioning oneself between the swing radius of articulating machinery and other stationary objects.
3. Assuming an operator can see workers near the equipment.
4. Using the bucket as work platform or as a means of personnel transport.

## Traffic Control Signage

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when installing temporary traffic control signage.

### **Safe practices to follow:**

1. Project hazard assessment must be completed or reviewed, and the findings must be communicated to co-workers.
2. Vehicles must be equipped with directional control signage.
3. Vehicles must be inspected before use.
4. Signs, poles, and other traffic control devices must be secured before proceeding to the work site.
5. Appropriate personal protective equipment must be available, in good condition and be used (vest, hardhat, foot protection, etc.).
6. No worker may ride in the back of vehicles.
7. Approved lifting devices and proper lifting techniques must be used.
8. Workers must be aware of pinch points.
9. Work should be done facing traffic flow, whenever possible.



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# Safe Job Procedures

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2<sup>nd</sup> Edition

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## Safe Job Procedures

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have prepared a series of documents outlining safe job procedures to promote occupational health, identifying and controlling/eliminating hazards. Pertinent documents are available on each type of equipment and potential hazard, as applicable to Joint Seal's jobsites.

### Safe job procedures

- Occupational health
- Work hazards, including fall protection
- Equipment
- Tools
- Traffic control

For each safe job procedure, there is a corresponding safe work practice, as outlined in Joint Seal's Safe work practices manual.

### Responsibilities by role

#### Managers:

All managers are responsible and accountable for the following, to achieve the successful implementation of all required safe job procedures:

- Ensuring resources are made available (a hard copy at the office and at jobsites).
- Ensuring that the procedures are understood by workers (new employee orientation, safety talks, written acknowledgement).
- Ensuring that safe job procedures are incorporated into all aspects of our business by all employees (review of supervisor checklists and employee observation).
- Participating in health and safety education programs.
- Overseeing the development and review of the existing safe job procedures.

#### Supervisors:

All supervisors are responsible and accountable for the following:

- Ensuring the enforcement of all safe job procedures, as applicable in the work areas under their direction.
- Ensuring that safe job procedures are incorporated into all aspects of our business by all employees (regular employee observation and checklist documentation).
- Protecting their fellow employees.

- Participating in health and safety education programs.
- Participating in the development and review of the existing safe job procedures.

Employees:

All employees are responsible and accountable for the following:

- Safely performing their work in accordance with written safe work practices and safe job procedures.
- Reporting any hazards or injuries and protecting their fellow employees.
- Participating in health and safety education programs.
- Participating in the development and review of the existing safe job procedures.

Contractors, subcontractors, visitors:

All contractors, agency-supplied personnel and visitors will be expected to abide by all applicable safe job procedures and established workplace rules.

All members of management, the Health and Safety Representative (HSR), and all workers must come together in making health and safety an integral component of our daily activities. Health and safety are a key requirement for our success and viability.

Sincerely,

Boris Gopka  
Executive Director

Date:

## I. Safe job procedures – Occupational Health

### Manual Lifting

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when manually lifting and moving heavy loads. Injuries may occur regardless of the weight of the object or the physical condition of the person doing the lifting, if proper precautions are not taken.

#### **Safe job procedure to follow to when lifting heavy objects/loads:**

1. Test the weight to be lifted. If it is bulky or heavy (more than 50 pounds), get help.
2. Clear the area of obstructions, litter, and tripping hazards.
3. Prepare the area where the object is to be placed.
4. Move close to the load.
5. Place one foot slightly ahead of the other foot, about 10 to 12 inches.
6. Squat down close to the load by bending at the knees.
7. Keep the back straight.
8. Place hands under or around the load, and get a good grip with the palms to keep the load from slipping.
9. Using leg muscles, lift gradually. Do not jerk or twist.
10. Keep the load close to the body.
11. Rotate body position by shifting the feet. Do *not* rotate the back.
12. Set the load down gradually by bending at the knees.
13. Keep a straight back when lowering the load.
14. Be especially careful when lifting in tight spaces and protect fingers at all times.
15. Avoid reaching out.

## Hazardous Materials

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed any time flammable liquids must be transported and handled.

### Transporting Flammable Liquids

1. Never carry gasoline and other highly flammable liquids in the passenger compartment of a vehicle.
2. Only use approved containers with a CSA or ULC label when you transport and store gasoline and other highly flammable liquids.
3. Ensure that the containers are not damaged, and that caps or fittings are properly secured after the containers have been filled.
4. Always transport flammable liquids in an upright position, secured to prevent overturning.
5. When transporting gasoline or other flammable liquids in a van, place the containers in the rear of the van, with adequate ventilation. Remove them as soon as you arrive at your destination.
6. Store a 5BC fire extinguisher in the driver's compartment when gasoline or other flammable liquids are transported in a van.
7. Never use gasoline as a cleaner.
8. Shut off gasoline engines and allowed them to cool before refuelling.

### Propane

1. Keep propane cylinders in an upright position, unless they were designed for horizontal use.
2. Store propane cylinders in a well-ventilated area away from heat sources, outdoors and above grade.
3. Only use approved hoses and fittings to connect a cylinder to tools and equipment.
4. Never leave propane cylinders and hose-connected devices (when not in use) in trenches or other low-lying areas. Propane is heavier than air and can settle in dangerous concentrations at

the bottom of trenches, maintenance chambers, vaults, basements, sumps and other below-grade areas.

5. Never look for leaks in a propane cylinder or hose with a flame. Use soapy water.

### Workplace Hazardous Material Information System

To ensure the safety of all the employees and to prevent injuries, the company has the Workplace Hazardous Material Information System (WHMIS) program in place.

#### **Employee training/Instruction**

All employees will receive WHMIS training as required under current legislation. A record of this training must be maintained.

#### **Material Safety Data Sheets (MSDs)**

All employees:

1. Check the corresponding MSD before working with any hazardous materials.

## Hearing Protection

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed any time there is exposure to noise that can potentially cause temporary or permanent hearing loss.

### **Safe job procedure to follow to prevent hearing damage:**

1. Receive training on how to use applicable Hearing Protection Devices (HDPs).
2. Follow supervisor's instructions on how to use HDPs, as applicable to the work to be carried out.
3. Always use HDPs when instructed to do so.

## Dust

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when dust is generated.

Safe job procedures include two types of preventative measures: ventilation and respiratory protection.

### **Safe job procedure to follow for protection against dust:**

1. Ventilate the jobsite by one of the following means, as outlined in Joint Seal's Safe Work Procedures, 2020 edition:
  - a. Natural dilution ventilation – When working inside, open doors and windows.
  - b. Mechanical dilution ventilation – Use fans, such as portable exhaust fans and wall fans, to force outside air into and out of the building, which will provide ventilation.
  - c. Local exhaust ventilation – Use exhaust fans, air cleaners, and ducted system dedicated to removing airborne contaminants at the source and exhausting them outdoors.
2. Use respiratory protection:
  - a. Consult the Respirator Selection Guide in CSAO's *Construction Health and Safety Manual* (M029) for activities that create dust and the appropriate Personal Protective Equipment (PPE).
  - b. Consult your supervisors when in doubt about choosing the correct respiratory protection.



## Cleaning Solvents and Flammable Liquids

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed any time flammable liquids or toxic solvents are used. Whenever possible, solvents should be non-flammable and non-toxic.

The supervisor must be aware of all solvents/flammables that are used on the job and be sure that all workers who use such materials have been instructed in their proper use and any hazard they pose.

### **Safe job procedure to follow:**

1. Use non-flammable solvents for general cleaning.
2. When using flammable liquids, never do any hot work in the area.
3. Store flammables and solvents in special storage areas.
4. Check toxic hazards of all solvents and controlled products before use (MSDS).
5. Provide adequate ventilation where all solvents and flammables are being used.
6. Use goggles or face shields to protect the face and eyes from splashes or sprays.
7. Use rubber gloves to protect the hands.
8. Wear protective clothing to prevent contamination of clothes.
9. Use the appropriate respiratory protection when breathing hazards exist.
10. Never leave solvents in open tubs or vats. Return them to storage drums or tanks.
11. Always use proper containers for transportation, storage and the field use of solvents/flammables.
12. Always follow all WHMIS requirements.

## Grinding

To ensure the safety of all the employees and to prevent injuries, safe work practices must be followed when grinding. Severe injury may occur if proper personal protective equipment is not used and maintained.

### **Safe job procedure to follow to prevent injuries:**

1. Check the tool rest for the correct distance from the abrasive wheel, maximum 1/8" or 3 mm.
2. The grindstone must be replaced when adjustment of the rest cannot provide 1/8" or 3 mm clearance.
3. Guards must be in place and fully functional.
4. If the wheel has been abused and ground to an angle or grooved, the wheel must be either refaced with the appropriate surfacing tool or replaced.
5. Goggles or a face shield must be used to protect the eyes at all times when grinding.
6. Each time a grinding wheel is replaced, check the maximum approved speed (stamped on the wheel) against the shaft rotation speed of the machine to ensure the safe speed is not exceeded.
7. A grinding wheel must not be operated at speeds exceeding the manufacturer's recommendation.
8. The flanges supporting the grinding wheel should be a maximum of 1/3 the diameter of the wheel and must fit the shaft rotating speed according to the manufacturer's recommendation.
9. Bench grinders are designed for peripheral grinding. Do not grind on the side of the wheel.
10. Do not stand directly in front of the grinding wheel when it is first started.
11. CSA-approved hearing protection must be worn.

## II. Safe job procedures – Hazard

### Access and Egress

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when accessing or egressing work sites.

#### **Steps to follow to ensure safety:**

1. If a work area is located above or below ground level, always use stairs, runway, ramp or ladder to access it and exit from it.
2. Make sure areas of access and egress are unobstructed.
3. Always keep areas of access and egress clear of snow, ice, or other slippery material.
4. Treat areas of access and egress with sand or similar material, when necessary, to ensure a firm footing.
5. When entering a shaft, use the stairway, ladder, ladderway, cage, or a car on a hoist provided, taking the necessary precautions.

## Electrical Safety

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when working with or near electrical devices, as accidental contact with electrical components can be deadly.

### **Steps to follow to ensure safety when using new electrical appliances, tools and equipment:**

1. Send off all electrical appliances, tools and equipment to be serviced and repaired only to qualified and authorized electricians.
2. Ensure the work surface is dry before operating electrical-powered tools and equipment.
3. Tag all the tools with damaged cords, grounds and housing units as “Out of Service” and send them for repair.
4. Send off any missing or damaged ground plugs of any appliance, tool or piece of equipment for repair before attempting to use them.
5. Tag all damaged extension cords as “Out of Service” and send them off to be repaired or replaced, as warranted.
6. Always stand to the side of a service box when resetting a breaker.
7. Only use C.S.A. approved electrical tools.
8. Disconnect power tools from power source before making adjustments.
9. Remove any tool with electrical arcing brushes if you feel any tingling during use.

## Fire and Fire Extinguishers

To ensure the safety of all the employees and to prevent injuries, safe job practices must be followed in case of fire and when operating fire extinguishers.

Since fire can start anywhere, it is essential to know which type of fire extinguisher to use and how to use it.

Workers must receive training before using such equipment.

### **Steps to follow to ensure safety when using fire extinguishers:**

1. Check that the pressure indicator is full, and after pulling the pin, a very short burst with the extinguisher as a check to make sure it works - if it does not work, leave immediately.
2. Approach the fire with caution, and make sure there is a clear path to an exit behind you.
3. KEEP well back from the fire.
4. PULL the pin on the fire extinguisher.
5. AIM the extinguisher nozzle at the base of the fire.
6. SQUEEZE the handle.
7. SWEEP from side to side.
8. BE CAREFUL and watch for re-ignition.
9. Leave immediately if the fire is still burning after using one full extinguisher - it is likely the fire is too large for you to fight.

## Housekeeping

To ensure the safety of all the employees and to prevent injuries, the workplace must be kept clean. All employees, contractors and subcontractors are required to contribute to workplace safety.

### **Practices to follow to ensure safety:**

1. Eliminate all tripping hazards and slippery conditions. Make sure all aisles and access ways are not obstructed in any way.
2. Keep exterior walkways and stairways free of snow, ice and obstacles.
3. Watch for and eliminate hazards, such as nails, pieces of scrap metal, grease and oil.
4. Clean up spills promptly with proper absorbing materials and agents.
5. Place different types of garbage in appropriate containers.
6. Store all oily rags in appropriate fire-approved steel containers.
7. Store all materials away from power lines and in an appropriate manner to prevent tipping/spilling.
8. Do not stack or pile bagged or sacked material more than ten high, and make sure it is cross piled on skids so that in all cases, no one can be injured because the material falls, rolls, overturns or breaks.
9. Barrels may be stacked upright with platforms/planks between layers and should not be stacked any higher than the mechanical equipment can safely reach.
10. Stockpile skids of brick blocks or other such material in such a manner as to prevent tipping or collapsing.
11. Pay attention to any signs must be posted as a warning of hazardous areas.

## Tagging and Lockout

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed to ensure proper tagging and lockout.

### Practices to follow to ensure safety:

1. Review drawings of the system to be de-energized and de-activated to determine the switches, power sources, controls, interlocks, or other such devices necessary to isolate the system. Confirm with the client/owner where required.
2. Test the system with a CSA-certified potential test indicator to ensure that all components are de-energized and de-activated, including interlocking or dependent systems which could feed into the system being isolated, whether mechanically or electrically. Potential test indicators should not be used beyond the voltage limits for which they are rated.
3. Observe the following safeguards for locking out and tagging:
  - a) After the circuit has been de-energized, locked out by the person in charge, place your own safety lock on the disconnect switch. Retain the key for this lock while the lock is in place.
  - b) Where several workers or trades are working on the circuit, each one will have his/her own lock to be used on a lockout bar. Accommodate the necessary number of locks by placing another lockout bar in the last hole of the previous bar.
  - c) In accordance with Section 190(6)3. of the current *Regulations for Construction Projects* (O.Reg. 213/91), attach a durable tag to your lock (one per worker), filled out with the following information:
    - Reason why the equipment was disconnected;
    - Name of person responsible for the disconnection and his/her employer; and
    - Date on which the equipment was disconnected.
  - d) Discharge the de-energized electrical system must by short circuit and phase to ground. Attach a temporary ground cable to the system and remain in place until work is completed.
4. Keep a record of the devices opened, locked out or otherwise rendered inoperable so that all of these devices can be reactivated once work is complete.

5. Place signs on the system indicating that it is not to be energized or operated and that guards, locks, temporary ground cables, chains, tags, and other safeguards are not to be tampered with or removed until work is complete.
6. When any worker is testing electrical equipment, do the following:
  - Remove all watches, rings, neck chains or other current-conducting jewelry;
  - Wear electric shock resistant footwear; and
  - Wear safety glasses with side shields.

### Trenches and Excavation

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed to ensure safe trenching and excavation.

Since soil conditions and stability can vary, different factors must be kept in mind: type of soil, previously disturbed soil, drying of walls and sub-surface weeping.

#### **Safe job procedure to follow to ensure safety:**

1. Shore all earth trenches more than 1.2 metres (4 feet) deep that any worker is required to enter, with timbers or a pre-fabricated trench box, or support them by an approved support system, in accordance with the current *Regulations for Construction Projects*. You may also cut such trenches with embankment slopes of 1 to 1 (45 degrees).
2. Use ladders for getting into or out of a shored trench. Make sure they are placed in such a way that every worker is protected at all times when using the ladder.
3. Do not do any work in a trench unless another worker is working above ground in close proximity to the trench or to the means of accessing it.
4. Locate and mark any buried services, such as gas lines, water lines, sewers and electrical services before doing any excavation.
5. Install timber shoring progressively, as the trench is being excavated.
6. Keep all excavations which workers are required to enter reasonably free of water.

Tools, equipment and excavated soil must be kept at least 1 metre (3 feet) from the edge of the excavation or trench.



## Welding, Cutting, and Burning

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed any time welding, cutting, and burning are necessary. Such work can create fires and breathing hazards for workers on any job.

### **Procedures to follow to ensure safety:**

1. Make sure there is adequate ventilation, since hazardous fumes can be created during welding, cutting or burning.
2. Alert fellow workers when they may also be exposed to the hazards created by welding, cutting and burning. They must be protected by the use of “screens”.
3. Never start work without proper authorization.
4. Keep fire fighting equipment on hand before starting.
5. Check the work area for combustible material and possible flammable vapours.
6. A welder should never work alone – a fire or sparks watch should be maintained.
7. Protect cables and hoses from slag or sparks.
8. Never weld or cut lines, drums, tanks, etc. that have been in service without making sure that all have been purged or other necessary precautions are in place.
9. Never enter, weld or cut in a confined space without proper air quality testing and a qualified safety lookout in place.
10. When working overhead, use fire resistant materials (blankets, tarps) to control or contain slag and sparks.
11. Never do any cutting or welding where sparks and cutting slag will fall on cylinders.
12. Open all cylinder valves slowly. The wrench used for opening the cylinder valves should remain on the valve spindle.

### III. Safe job procedures – Fall Protection

#### Fall Protection

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when it comes to fall protection, when applicable.

#### **Working from Scaffolds**

1. Ensure scaffold platforms are fully planked.
2. Make sure guardrails consisting of a top rail, mid-rail and toe board are in place whenever the working platform is 2.4 metres (8 feet) or more above floor level.
3. Lock wheels and casters when personnel are working on the scaffold.
4. If the scaffold is more than 2.4 metres (8 feet) high, it must not be moved with personnel on it unless:
  - a. they wear full body harness with lanyard and shock absorber tied off to an independent fixed support, and
  - b. the floor is firm and level.

#### **Working from Ladders and in Hazardous Areas**

1. Always wear a full body harness with lanyard and shock absorber tied off to either an independent fixed support or a lifeline whenever you are:
  - a. 3 metres (10 feet) or more above the floor, or
  - b. above operating machinery, or
  - c. above hazardous substances or objects.

#### **Using Fall Protection Equipment**

1. Make sure all safety belts, full body harnesses and lanyards are C.S.A. certified and carry a C.S.A. label.
2. Fit all safety harnesses and belts snugly and wear them with all hardware and straps intact and properly fastened.
3. Use lanyards which are 5/8" diameter nylon or equivalent.
4. Center the D-rings on the safety belts on your back.

5. Secure the lanyard or lifeline/lanyard combination to a rigid support capable of resisting the peak arrest forces of 1800 lbs minimum for fall arrest protection purposes. Adjust its length so that the wearer will be prevented from falling more than 1.5 meters from where he/she stands.
6. When the lifeline consists of wire rope, or the connecting lanyard consists of nylon webbing, use a shock-absorbing lanyard.

## Guardrails

To ensure the safety of all the employees and to prevent injuries, guardrails should be used to aid in fall protection when there is a danger of a worker falling 3 metres or more, or from a lesser height that might involve an unusual risk or injury.

### **Safe procedures to follow to ensure safe installation and operation:**

1. Workers installing or removing guardrails above 3 metres will be tied off to prevent falls.
2. Install guardrails no more than 30 cm from an open edge.
3. Ensure guardrail material is free of damage and defect.
4. Place support posts no more than 2.4 metres (8 ft) apart and securely anchor them securely.
5. Make sure all guardrails are complete:
  - top rail 1 metre above platform;
  - mid rail halfway between top rail and toe board; and
  - toe board 10 cm high and secured to inner side of posts.
6. Make sure posts and rails are capable of withstanding a force of at least 200 lbs applied at any point.
7. Do not begin any work in the area until guardrails have been inspected by your supervisor.

## Guardrail Removal

When there is a need to remove guardrails, safe job procedures must be followed to ensure safety and prevent injuries.

### **Safe procedures to follow to ensure safe removal:**

1. Remove snow, ice, or water from the area to be cordoned off.
2. Cordon off the area where guardrails will be removed using yellow caution tape.
3. Tie yellow caution tape to the top of the perimeter guardrails, approximately 6 ft. from where guardrails will be removed. Then, tie the tape around the first section of columns inside the building. This taped-off area must extend a minimum of 8 ft. from the edge. If there are no columns, use 4ft.-high rubber cones.
4. Setup warning signs that read "Danger Due to Fall Hazard", outside the cordoned area.
5. Verbally warn workers in the vicinity about the upcoming work.
6. Wear and use travel restraint system at all times when working inside the cordoned area.
7. Site supervisor must pre-select anchor points.
8. Before the lift, ask the crane operator whether or not it is safe to lift the material.
9. Secure area below the hoist operations.
10. Remove guardrails at the perimeter.
11. Handle equipment carefully to prevent it from falling over the edge. Place the removed guardrail sections in a secure location.
12. Before hoisting material, confirm that radio transmission between the crane operator and the signaller are operating properly. If hand signals are used, both parties must be trained in hoisting hand signals.
13. Confirm with crane operator weight of load being lifted and building slab capacity.
14. Stand clear of material while it is being lowered.
15. Move hoisted material into the building. Where possible use mechanical lifting devices. Otherwise, use proper lifting techniques.
16. Replace guardrails immediately after all material is received. Continue to wear travel restraint systems until guardrails are properly secured.
17. Remove tape and sign. Discard tape immediately after dismantling and return danger sign to the storage area.

## IV. Safe job procedures – Equipment

### Company Vehicles

All employees who drive Joint Seal Waterproofing vehicles must hold a valid driver's license applicable to the type of vehicle being operated.

#### **Steps to follow to ensure safe operation:**

1. Check vehicle fluid levels, running gear and electrical components prior to use.
2. Operate at or below posted speed limits and at a speed that is appropriate for road conditions.
3. Back into your parking space at ALL times.
4. Walk around the vehicle prior to reversing.
5. Ensure that all loads are covered and properly secured.
6. Ensure that the vehicle is kept clean.
7. Treat the public in a courteous manner at all times.
8. Always wear your seatbelt when the unit is in motion.

#### **Never do the following:**

1. Operate a defective vehicle. Report any problems to a mechanic and have it repaired prior to use.
2. Offer rides to anyone other than Joint Seal Waterproofing employees.
3. Allow passengers to ride in the back of a pick-up or any unit that is not equipped with approved seats and restraining devices.
4. Leave the vehicle running and unattended.
5. Smoke inside the vehicle.

#### **IMPORTANT:**

- Serious violations of the *Highway Traffic Act*, such as careless driving, may result in termination.
- Operators are responsible for any fines that are levied by a peace officer.

## Ladders

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using ladders.

### Safe practices to follow to ensure safe operation:

1. Set up ladders on a firm level surface. Use a mud sill if the base of the ladder is on soft, uncompacted or rough soil.
2. Tie off or otherwise secure straight ladders to prevent movement. Otherwise, one worker will hold the base of the ladder while it is being used.
3. When a task must be done while standing on an extension ladder, make sure that the ladder is long enough to allow standing on a rung no higher than the fourth from the top.
4. When climbing up or down, always face the ladder.
5. You may set up ladders in passageways, doorways, driveways or other locations where they can be struck or bumped by persons or vehicles, *only* if suitable barricades or other protection has been installed.
6. Do not erect ladders on boxes, carts, tables, scaffold platforms, elevating work platforms or on vehicles.
7. Set up straight ladders at an angle such that the horizontal distance between the top support and the base is not less than one-quarter, or greater than one third of the vertical distance between these points.
8. Never use metal ladders or ladders with wire reinforcing near energized electrical conductors.
9. Only use wooden ladders if they have not been painted or if they have been finished with a clear non-conductive wood preservative.
10. Securely fasten all ladders installed between levels, and make sure they extend 90 centimetres (3 feet) above the top landing and allow for clear access at top and bottom.
11. Never use ladders with weakened, broken, bent or missing steps, broken or bent side rails, broken, damaged or missing non-slip bases, or otherwise defective. Tag all defective ladders and remove them from the worksite.
12. Never use ladders horizontally as scaffold planks, or for any service for which they have not been designed.
13. Do not straddle the space between the ladder and another object while working on a ladder.
14. Always maintain three points of contact (two hands and one foot, or two feet and one hand) when climbing up or down a ladder.

## Portable Ladders

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using portable ladders.

### **Safe procedure to follow to ensure safe operation:**

1. Make sure the ladder has a non-slip base.
2. When setting up a ladder, secure the base and “walk” the ladder into place.
3. Set the ladder at the proper angle of one foot out at the base for every four feet of height.
4. Before using a ladder, make sure it is secured in place.
5. After putting the ladder in position, make sure it protrudes one meter above the intended landing point.
6. Do not work from the top two rungs of a ladder.
7. Do not overreach while on a ladder. Instead, climb down and move the ladder over a few feet to a new position.
8. Always face the ladder when using it. Grip it firmly and use the three-point contact method (two feet and one hand or one foot and two hands) when moving up or down.
9. Make sure there is the minimum overlap of one meter on an extension ladder, unless otherwise specified by the manufacturer.
10. Keep metal and wood ladders away from electrical sources.

## Step Ladder

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using step ladders.

Step ladders must be in good condition and appropriate for the work to be done. Use them only on clean and even surfaces.

### **Safe practices to follow to ensure safe operation:**

1. Never do any work from the top two rungs of a step ladder, counting the top platform as a rung.
2. Only use the step ladder in the fully opened position, with the spreader bars locked.
3. Do not use tops of step ladders as support for scaffolds.
4. Do not overreach while on the ladder. Climb down and move the ladder over.
5. Only use construction-grade ladders.

## Scaffolding

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when setting up and using scaffolding.

### **Safe procedure to follow to ensure safe operation:**

1. Carry out the set-up and dismantling of scaffolds under the supervision of a competent and experienced worker.
2. If you are setting up and dismantling a scaffold more than 2.4 metres (8 feet) high, you must be tied off with a full body harness and lanyard equipped with a shock absorber.
3. Set up scaffolds with all braces, pins, screw jacks, base plates, and other fittings installed, as required by the manufacturer.
4. Brace scaffolds adequately, both horizontally and vertically.
5. Make sure scaffolds are equipped with guardrails consisting of a top rail, mid-rail and toe board.
6. Make sure scaffold platforms are at least 46 centimetres (18 inches) wide, and if they are over 2.4 metres (8 feet) high, ensure they are planked across their full width.
7. Tie scaffolds into a building at vertical intervals not exceeding three times the least lateral dimension, including the dimension of any outrigger stabilizing devices.
8. Where scaffolds cannot be tied into a building, use adequately secured guy lines to provide stability.
9. Pin scaffold frames properly together – where scaffolds are two frames or more in height, or where they are used as rolling scaffold towers.
10. Set up, use and maintain scaffolds in a reasonably plumb condition.
11. Securely fasten scaffold planks to prevent them from sliding.
12. Install scaffold planks so that they overhang by at least 15 centimetres (6 inches) but no more than 30 centimetres (12 inches).



## Elevating Work Platforms

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using elevating work platforms.

### **Safe procedures to follow to ensure safe operation:**

1. Operate an elevating work platform only if you have been trained in the machine's operation.
2. Do daily inspection, in accordance with manufacturer's instructions.
3. If you are working on an elevating work platform, you must wear a harness and lanyard equipped with a shock absorber at all times, and be tied off to the appropriate fixed point.
4. Use elevating work platforms only on working surfaces for which the machine was designed.
5. Use elevating work platforms up to but not exceeding the maximum rated working loads. Make sure all loads are evenly distributed.
6. Do not lift overhanging loads on an elevating work platform.
7. Make sure all equipment has working alarms and emergency controls.
8. When an elevating work platform is used to lift materials, ensure that the materials are firmly secured to the platform.
9. Do not place any type of makeshift platform (boxes, ladders, scaffolds, etc.) on an elevating work platform to gain access to areas above.
10. Only use an extension device from the manufacturer to extend the platform on an elevating work platform.
11. Do not bridge a gap between elevating work platform and other work areas by planks or other materials.
12. Do not use elevating work platforms in high wind conditions.
13. Do not use elevating work platforms for pulling, pushing and/or dragging materials.
14. Turn off elevating work platforms in an enclosed work area when not in use, to prevent the accumulation of exhaust fumes.

## V. Safe job procedures – Tools

### Chain Saws

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using chain saws.

Workers must be trained in proper chain saw use.

#### **Safe practices to follow to ensure safe operation:**

1. Wear proper personal protective equipment, as set out by the manufacturer and the Occupational Health & Safety Legislation.
2. Fuel saws in a well-ventilated area and not while running or hot.
3. Do refuelling with an approved safety container with approved spout or funnel.
4. Use the correct methods of starting, holding, carrying, storage and use of the saw, as directed by the manufacture.
5. Ensure that the chain brake is functioning properly, to stop the chain when necessary.
6. Make sure the chain is sharp, has the correct tension, and is adequately lubricated.
7. When carrying/transporting a chain saw, ensure the bar guard is in place, the chain bar is toward the back, and the motor is shut off.
8. Do not use the chain saw for cutting above shoulder height.
9. Do maintenance according to manufacturer's specifications.
10. Use chain saws that comply with CSA Standards Z62.1-03.

## Circular Saws

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using circular saws.

Workers must be trained in proper circular saw use.

### **Safe procedure to follow to ensure safe operation:**

1. Wear approved safety equipment, such as safety glasses or a face shield.
2. Where harmful vapours or dust is created, use approved respiratory protection.
3. Select and use the proper blade, designed for the work to be done.
4. Disconnect the power supply before any adjustments to the saw are made, or the blade is changed.
5. Before setting down the saw, make sure the retracting guard is fully returned to its down position.
6. Hold the saw with both hands while sawing.
7. Do maintenance according to manufacturer's specifications.
8. Ensure all cords are clear of the cutting area before starting to cut.
9. Before cutting, check the area to ensure there are no foreign objects or any other obstruction which could cause the saw to "kick back".
10. When ripping, make sure the stock is held securely in place. Use a wedge to keep the stock from closing and causing the saw to bind.

## Power Tools

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using power tools. Severe injury may occur if such tools are not used and maintained properly.

### **Safe procedure to follow to prevent injuries:**

1. Read the manual carefully to learn your power tool's applications, limitations and any potential hazards.
2. Make sure tools are grounded if they are not double insulated.
3. Do not use power tools in rain, damp or wet locations, or in the presence of explosive atmospheres (gaseous fumes, dust or flammable materials).
4. Remove materials or debris that may be ignited by sparks.
5. Keep your work area clean and well lit.
6. Do not wear any loose clothing or jewelry.
7. Wear a protective hair covering to contain long hair, which may be caught in moving parts.
8. Wear rubber gloves and insulated non-skid footwear outdoors.
9. Keep hands away from moving parts.
10. Wear safety goggles or glasses with side shields that comply with current safety standards.
11. Wear hearing protection during extended use of a power tool.
12. Wear a dust mask during dusty operations.
13. Wear other personal protective equipment, as required.
14. Keep a fire extinguisher nearby.

15. Make sure all bystanders are at a safe distance from the work area to protect themselves and the operator.
16. Provide barriers or shields, as necessary, to protect others in the work area from sparks and debris.
17. Secure work with a clamp, vise or other practical means of holding work secure. Use both hands to control the tool.
18. Do not use tools or attachments to do jobs they were not designed for. Do not alter tools.
19. Do not use non-recommended accessories as they may be hazardous.
20. Do not defeat a guard or other safety device when installing an accessory or attachment.
21. Inspect guards and other parts before use. Check for misalignment, binding of moving parts, improper mounting, broken parts and any other condition that may affect operation.
22. In case of any abnormal noise or vibration, turn off the tool immediately and get the problem corrected before using the tool further.
23. Remove all adjusting keys and wrenches from the tool before the power is turned on.
24. Prevent body contact with grounded surfaces, such as pipes, radiators, ranges and refrigerators.
25. When making blind or plunge cuts, check the work area for hidden wires or pipes.
26. Hold your tool by insulated non-metal grasping surfaces.
27. Use a Ground Fault Circuit Interceptor (GFCI) to reduce shock hazards.
28. Do not force a tool to perform at a rate other than for what it was designed.
29. Keep hands away from all cutting edges and moving parts.
30. Never carry a tool by its cord or unplug it by yanking cord from the outlet. Use the plug for pulling the cord, to reduce the risk of damage.

31. Keep the cord away from heat, oil, sharp objects, cutting edges and moving parts.
32. Do not overreach. Always maintain proper footing and balance. Exercise extra care when using tool on ladders, roofs, scaffolds, etc.
33. Do not use a tool when you are tired, distracted or under the influence of drugs, alcohol or any medication which decreases control.
34. Unplug the tool when not in use, before changing accessories or performing recommended maintenance.
35. Maintain tools properly. Keep handles dry, clean and free from oil and grease. Keep cutting edges sharp and clean. Follow instructions for lubricating and changing accessories.
36. Periodically inspect tool cords and extension cords for damage.
37. When power tools are not in use, store them in the proper storage cases. If equipment does not have a proper storage case, store it in an on-site job box with lock, or return it to storage crib at the shop.
38. Report any damaged tools immediately to ensure replacement or repair can be done. Label the damaged tools with "DO NOT USE".
39. Maintain all labels and nameplates.

## Propane Torch

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using propane torches.

Workers applying torch on products can receive serious burns from both the torch flame (due to the temperatures reaching over 1093°C) and the torch itself.

### **Safe procedure to follow to ensure safe operation:**

1. When using a torch, wear additional protective clothing (gloves, eye protection).
2. Torching equipment must be in good working condition, and the cylinder valves must be clean. Check fittings, hoses and heads.
3. DO NOT USE defective equipment.
4. Use soapy water to check connections for leaks.
5. Only use a spark lighter or electronic starter for lighting the torch.
6. Protect propane hose from damage with the following actions:
  - Keeping torch flame away from hose.
  - Keeping hose free of kinks.
  - Not running over hose with equipment.
  - Not using the hose to lift the cylinder.
7. A torch flame is difficult to see in daylight, be aware of and keep away from the flame.
8. If you are not the operator, stay at least 1 metre away from the torch.
9. Set torch units into support leg position when not in use.
10. To shut off torch, close cylinder valve first, let gas burn out, and then close torch valve.
11. At the end of the day, disconnect hoses and store them properly.
12. NEVER LEAVE AN OPERATING TORCH UNATTENDED.

## Portable Grinders

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using portable grinders. Severe injury may occur if abrasive wheels are not properly stored, used and maintained.

### **Safe procedure to follow to prevent injuries:**

1. You must be trained in using a grinder before attempting use.
2. Make sure proper guards are in place.
3. Never exceed the maximum wheel speed RPM, as indicated on each wheel.
4. Compare the speed marked on the wheel to the speed marked on the grinder.
5. When installing the wheel, check for cracks and defects. Ensure mounting flanges are clean, and the mounting blotters are used. Do not overtighten the mounting nut.
6. Before grinding, run the newly mounted wheel at operating speed, checking for vibration.
7. Never use grinders near flammable materials.
8. Never use grinders for jobs they were not designed for, such as cutting.
9. Wear CSA-approved personal protective equipment must be worn, including eye, face, hand, foot, and hearing protection.



## Extension Cords

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using extension cords.

### **Safe procedure to follow to ensure prevent injuries:**

1. Only use portable extension cords of the outdoor type, and ensure they have been rated for 300 volts and have an insulated grounding conductor.
2. Only use CSA-approved extension cords and inspect them before use.
3. NEVER use defective cords. Tag and remove them from the worksite until repaired.
4. Protect extension cords during use to prevent damage from sharp edges, movement of materials, and flame cutting.
5. Protect all extension cords used in hazardous areas or in damp locations by using approved ground fault devices.

## Defective Tools

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when handling defective tools.

If a tool is defective in some way, DO NOT USE IT, to avoid injury.

Issues to be aware of:

- chisels and wedges with mushroomed heads;
- split or cracked handles;
- chipped or broken drill bits;
- wrenches with worn-out jaws;
- incomplete tools (files without handles, etc.);
- broken or inoperative guards;
- insufficient or improper grounding due to damage on double insulated tools;
- no ground wire (on plug) or cords of standard tools;
- the on/off switch not in good working order;
- tool blade is cracked; and
- the wrong grinder wheel is being used, or the guard has been wedged back on a power saw.

### Safe procedure to follow:

To ensure safe use of hand tools, always do the following:

1. never use a defective tool;
2. double check all tools prior to use; and
3. ensure defective tools are repaired.

To ensure safe use of air, gasoline or electric power tools:

1. ensure the tools are in good condition;
2. do not use tools if they are defective in *any* way; and
3. only use such tools if you have been trained and if you are attentive during use.

### IMPORTANT!

**Remove all defective tools from the work area and mark each one as**

**“DEFECTIVE – DO NOT USE.”**

## VI. Safe job procedures – Traffic Control

### Mobile Equipment

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when using mobile equipment to reduce the risk of personal injury.

Field workers must always be aware of mobile equipment operating in the area.

#### **Safe procedure to follow to reduce risk:**

1. Always wear a florescent traffic vest.
2. Ensure that the operator sees you.

#### **NEVER do the following:**

1. Walk next to, in front of, or behind mobile equipment that is operating.
2. Position yourself between the swing radius of articulating machinery and other stationary objects.
3. Assume an operator can always see you.
4. Use the bucket as work platform or as a means of personnel transport.

## Traffic Control Signage

To ensure the safety of all the employees and to prevent injuries, safe job procedures must be followed when installing temporary traffic control signage.

### **Safe procedure to follow:**

1. Complete or review the project hazard assessment and communicate the findings to co-workers.
2. Make sure vehicles are equipped with directional control signage.
3. Inspect vehicles inspected before use.
4. Secure all signs, poles, and other traffic control devices before proceeding to the work site.
5. Use appropriate personal protective equipment (vest, hardhat, foot protection, etc.) and make sure it is in good condition.
6. Never ride in the back of vehicles.
7. Use approved lifting devices and proper lifting techniques.
8. Be aware of pinch points.
9. Work facing traffic flow, whenever possible.



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## Company Rules

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Company Rules

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the Occupational Health and Safety Act and all associated regulations and agreements.

All members of management, supervisors and all workers must follow the rules established by the company to ensure a safe and productive work environment.

### **Safe and Productive Environment – Everyone's Priority**

Managers: All managers are responsible and accountable for ensuring that all the rules are provided to and understood by workers (rules shall be posted on the company bulletin board and be included in employee binders in company vehicles). Managers shall oversee the consistent enforcement of rules, made evident by corresponding documentation (checklists based on employee observation), and apply the appropriate progressive disciplinary action, as required.

Supervisors: All supervisors are responsible and accountable for ensuring all the rules are followed. Supervisors must familiarize all the workers with the rules and make sure they understood (explain them to workers and have them sign a corresponding form).

Employees: All employees are responsible and accountable for following all the company rules. If any of the rules are not followed, appropriate disciplinary action will be taken, as outlined below.

Contractors, agency-supplied personnel and visitors: Anyone hired by Joint Seal or present on Joint Seal premises or jobsites is expected to follow company rules.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Company Rules

To ensure a safe and productive work environment, all employees at Joint Seal Waterproofing shall abide by the following company rules at the office, in the warehouse, and on all jobsites:

- ◆ Report for work on time.
- ◆ Leaving during work hours or not returning to work after lunch or a break (except in an extreme emergency) – without prior notification to management – is not allowed.
- ◆ Employees must let their supervisor know if they will be absent at least one hour before the employee's scheduled starting time for the day shift, or 2 hours before the employee's scheduled starting time for night shift.
- ◆ The hours worked must be recorded on our "OneBuilder" app daily. NOTE: Hours entered after Saturday afternoon will be paid during the following pay period.
- ◆ All employees must treat everyone with respect and abide by our Workplace Violence and Harassment policy, and Anti-Discrimination policy (both included in our Health and Safety Manual.
- ◆ All employees must abide by our confidentiality policies.
- ◆ All employees must abide by our Smoking and Substance Abuse Policy (see below): no smoking or substances are allowed on company premises, jobsites or while performing their duties; employees must be fit for work at all times during their shift.
- ◆ Social media may not be used for personal purposes during work hours. Company-sensitive information, including images, shall not be published (for further details, refer to our Social Media Policy below).
- ◆ Sleeping on the job is not allowed.
- ◆ Employees must perform their duties in a diligent and safe manner. Horseplay will NOT be tolerated.
- ◆ Only those employees that hold a valid license may drive company vehicles.
- ◆ Employees must operate all equipment and tools with the corresponding guards and safety devices in place.
- ◆ Personal Protective Equipment (PPE) shall be used at all times, as required.
- ◆ Any work-related injury must be reported to management as soon as possible.
- ◆ Any damage to equipment, supplies, materials, machinery, or buildings must be reported to management as soon as possible.
- ◆ Visiting or loitering in areas other than those to which an employee has been assigned is not permitted.



- ◆ Littering is not permitted. Good housekeeping practices must be maintained (consult our Safe Work Practices manual).
- ◆ No posting, removing, altering, or defacing notices on company bulletin boards may be done without company approval.

## Disciplinary Policy

### Disciplinary Actions

Company rules are enforced at all levels by supervisors and management through observation and progressive disciplinary action, when required.

### Progressive Discipline

When corrective action is required, management goes through the following steps:

1. Verbal warning
2. Written warning
3. Suspension
4. Termination

**IMPORTANT:** Some conduct may lead to immediate dismissal (see the corresponding Immediate Termination section below).

#### **Verbal warning**

When an employee breaks any of the rules or a performance problem is first identified, supervisors or manager will thoroughly discuss the issue with the employee.

#### **Written warning**

If a private informal discussion with the employee has not resulted in corrective action, the supervisor shall meet with the employee to review the problem and issue a written warning.

The supervisor or manager shall:

1. Review the issue.
2. Permit the employee to present his or her views on the issue.
3. Advise the employee that the issue must be resolved.
4. Inform the employee that failure to resolve the issue will result in further disciplinary action, consisting of suspension and – if the issue persists – termination.

#### Counseling:

Depending on the nature of the problem, management might issue a counseling notice to the employee: the employee will be requested to take external counseling (e.g. in case of substance abuse) and be asked to return to his/her duties once the issue is resolved.

#### **Suspension**

An employee may be suspended from work, with corresponding pay deductions, if his/her actions have not been corrected after a verbal and written warnings have been issued.

## **Termination**

An employee may be dismissed if his/her actions have not been corrected after the first three steps of the progressive disciplinary procedure were followed.

### **Immediate Termination**

Some conduct may result in immediate dismissal. The following behaviors may lead to immediate termination:

- Dishonesty (including, but not limited to, theft).
- Insubordination (refusal to perform assigned duties – with the exception of refusing to do work for health and safety reasons – or to follow orders of management).
- Fighting or assault on someone on company premises or any of the jobsites.
- Possession of or bringing onto the company's premises or jobsites dangerous weapons of any kind or other contraband.
- Deliberate destruction of, or damage to, company property or products.
- Possession of, drinking, or being under the influence of alcohol on company premises/jobsites or while on duty.
- Possession, use, or being under the influence of drugs, narcotics, or other intoxicants while on company premises/jobsites or while on duty.
- Harassment (e.g., sexual, age, race, national origin, religion) of other employees, vendors, or customers.

### **Recordkeeping**

Management will fill out a corresponding format and keep it in the employee's file for two years. Both the employee in question and the supervisor applying disciplinary action will sign the acknowledgement.

# Smoking and Substance Abuse Policy

## Overview

Joint Seal Waterproofing is committed to the health and safety of its employees and has adopted this policy to communicate its expectations and guidelines [Guidelines](#)

surrounding substance use, misuse, and abuse.

## Guidelines

Employees under the influence of drugs or alcohol on the job can pose serious health and safety risks to both themselves and their fellow employees. To help ensure a safe and healthy workplace, Joint Seal Waterproofing reserves the right to prohibit certain items and substances from being brought onto or present on company premises.

## Definitions

Drug: Any substance which can change or adversely affect the way a person thinks or feels, whether obtained legally or illegally. This could include recreational cannabis, cocaine, opiates, and amphetamines.

Drug paraphernalia: Material or equipment used or intended for use in injecting, ingesting, inhaling, or otherwise introducing a drug, illegal or controlled, into the human body.

Medication: Includes a drug obtained legally, either over the counter, or through a prescription or authorization issued by a medical practitioner.

**IMPORTANT:** For this policy, medications of concern are those that inhibit a worker's ability to perform their job safely and productively.

Alcohol: Any beverage containing any quantity of alcohol, including, beer, wine, and distilled spirits.

## Roles and Responsibilities

### Employer will:

- Clearly communicate expectations surrounding alcohol and drug use, misuse, and abuse;
- Maintain a program of employee health and awareness;
- Provide a safe work environment; and
- Review and update this policy regularly.

### Management will:

- Identify any situations that may cause concern regarding an employee's ability to safely perform their job functions;
- Ensure that any employee who asks for help due to a drug or alcohol dependency is provided with the appropriate support (including accommodation) and is not disciplined for doing so; and
- Maintain confidentiality and employee privacy.

### Employees must:

- Abide by the provisions of this policy and be aware of their responsibilities under it;
- Arrive to work fit for duty, and remain so for the duration of their shift;
- Perform work safely in accordance with established safe work practices;
- Avoid the consumption, possession, sale, or distribution of drugs or alcohol on company property and during working hours (even if off company property);
- When off duty, refuse a request to come into work if unfit for duty;
- Report limitations and required modifications as a result of prescription medication;
- Report unfit co-workers to management;
- Seek advice and appropriate treatment, where required;
- Communicate dependency or emerging dependency to management or human resources; and
- Follow the after-care program, where established.

## Prohibited Items

The use, possession, sale, manufacture, distribution, dispensation, concealment, receipt, transportation, or being under the influence of any of the following items or substances on company property by employees and all others, is prohibited:

- Illegal drugs, controlled substances, marijuana (even medical cannabis), intoxicants (legal or illegal), "look-alike" substances, designer drugs, counterfeit or synthetic drugs, inhalants, and any other drugs or substances that will, in any way, affect safety, work ability, alertness, coordination, judgment, response, or the safety of others on the job.

- Alcoholic beverages. Consuming them while driving, or driving any vehicle for company business while intoxicated is prohibited. The consumption of alcohol on company time or on company property is prohibited.
- Drug paraphernalia.

## Policy Enforcement

Because of the importance of this policy, the company reserves the right, at all times, while on company premises and property and when circumstances warrant, to have company supervisors and/or authorized search and inspection specialists, including scent-trained dogs, conduct searches and inspections of employees, or other persons, and their personal property and effects, to include, but not be limited to, lunch boxes, purses, briefcases, baggage, offices, desks, clothing, and vehicles (including trunks, glove compartments, etc.), for the purpose of determining if such employees or other persons are using, possessing, selling, manufacturing, distributing, dispensing, concealing, receiving, or transporting any of the prohibited items and substances contained in the policy.

All employees are expected to cooperate with any investigation regarding this policy. Failure to cooperate, providing false information, or omitting information may subject any employee to disciplinary action up to and including termination of employment.

## Off-the-Job Alcohol and Other Substance Use

Employees who use drugs, alcohol, or chemical substances off-the-job run the risk of jeopardizing the safety of themselves, their family, the public, and the company. Whenever such usage adversely affects public trust in the company or otherwise interferes with the company's ability to carry out its responsibilities, or increases potential liability for the company, the company may be forced to take disciplinary action against the offending employee(s), up to and including termination of employment. Employees who are convicted or plead guilty or *nolo contendere* because of off-the-job activities (drug or alcohol related) may be considered in violation of this policy. In deciding what action to take, the company will consider the nature of the charges and other factors relative to the impact of the employee's conviction or plea on company business.

This policy supersedes any and all other company drug policies.

# Social Media Policy

## POLICY

This policy provides guidance for employee use of social media – blogs, wikis, microblogs, message boards, chat rooms, electronic newsletters, online forums, social networking sites, and other sites and services that permit users to share information with others in a contemporaneous manner.

## PROCEDURES

### Personal Use

Personal use of social media is not allowed during work hours.

### Professional Use

The following principles apply to professional use of social media on behalf of Joint Seal Waterproofing, as well as personal use of social media when referencing Joint Seal Waterproofing.

- Employees need to know and adhere to this policy.
- Employees should be aware of the effect their actions may have on their images, as well as Joint Seal's image. The information that employees post or publish may be public information for a long time.
- Employees should be aware that the employer may observe content and information made available by employees through social media. Employees should use their best judgment in posting material that is neither inappropriate nor harmful to Joint Seal, its employees, or customers.
- Although not an exclusive list, some specific examples of prohibited social media conduct include posting commentary, content, or images that are defamatory, pornographic, proprietary, harassing, libelous, or that can create a hostile work environment.
- Employees are not to publish, post or release any information that is considered confidential or not public. If there are questions about what is considered confidential, employees should check with the management.
- Social media networks, blogs and other types of online content sometimes generate press and media attention or legal questions. Employees should refer these inquiries to management.
- If employees encounter a situation while using social media that threatens to become antagonistic, employees should disengage from the dialogue in a polite manner and seek the advice of a supervisor.
- Employees should get appropriate permission before referring to or post images of current or former employees, members, vendors or suppliers. Additionally, employees should get appropriate permission to use a third party's copyrights, copyrighted material, trademarks, service marks or other intellectual property.
- Social media use shouldn't interfere with employee's responsibilities at Joint Seal Waterproofing. Company computer systems are to be used for business purposes only. When using the company computer systems, use of social media for business purposes is allowed (ex: Facebook, Twitter, company blogs and LinkedIn), but personal use of social media networks or personal blogging of online content is discouraged and could result in disciplinary action.

- Subject to applicable law, after-hours online activity that violates any Joint Seal Waterproofing's policies may subject an employee to disciplinary action or termination.
- If employees publish content after-hours that involves work or subjects associated with Joint Seal Waterproofing, a disclaimer should be used, such as this: "The postings on this site are my own and may not represent Joint Seal Waterproofing's positions, strategies or opinions."
- It is highly recommended that employees keep Joint Seal Waterproofing's related social media accounts separate from personal accounts, if practical.



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# Personal Protective Equipment (PPE)

2021

3<sup>rd</sup> Edition

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## Personal Protective Equipment

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a policy on the mandatory use of Personal Protective Equipment (PPE), as required for each work area and specific job type, as applicable to the company's operations:

### Work area:

Office, warehouse, balconies, garages, elevator shafts, hospitals, roofs, stairs, utility rooms, tunnels, maintenance chambers, sidewalks, airport apron surfaces, as well as when driving to job sites using company vehicles.

### Job type:

Chipping, grinding, patching, parging, expansion joint injection, caulking.

### Tool use:

Circular saws, chain saws, portable grinders, power tools, extension cords, propane torch, chipping guns, caulking guns; actions to take when handling defective tools.

### **Criteria for PPE Selection**

Decision on which PPE is required is made based on the corresponding legislation, potential hazard presented by each work area and job type (hazard assessment is carried out regularly), and the MSDs. See the corresponding section below for examples of PPE and its selection.

### **PPE Provision and Availability**

All the PPE is provided to employees by the company and is made available for each work area and job type, as needed.

### **Proper PPE Fitting, Care, Use, Inspection, and Maintenance**

Joint Seal provides guidelines for the proper fitting, care and use of specialized PPE (see the corresponding section below). Regular inspections and maintenance are carried out to ensure that all PPE continuously meets legislated requirements.

### **Employee Training**

In order to ensure employee safety and to prevent injuries, each employee will be made aware of the hazards associated with each work area and job type, and which PPE is required for protection: onsite and job-specific training will be provided, as required, after a general training on PPE. Employees will be trained on the proper fitting, care, use and maintenance of all the specialized PPE they will need.

Each employee using PPE will know the following upon completion of PPE training:

- When PPE is necessary
- What PPE is necessary and which PPE has been selected for each process the employee operates
- How to properly put on, take off, adjust and wear PPE
- The limitations of the PPE
- How to determine if PPE is no longer effective or is damaged
- How to get replacement PPE
- How to properly care for, maintain, store, and dispose of PPE

After employees have been trained, periodic assessment of the process/equipment will be conducted to ensure that the PPE is adequate, and training is appropriate.

Retraining of employees will be carried out whenever:

- Previous training is no longer applicable due to changes in the workplace
- Previous training is no longer applicable due to changes in the type of PPE required
- Employer observed inadequacies in employees' knowledge or use of assigned PPE

Employers will verify that each employee who is required to use PPE has received and understood the required training by means of written acknowledgement.

Personal Protective Equipment must be worn by all our staff – managers, supervisors, and workers – as well as sub-contractors, as required on a given jobsite and for a given job type.

Ensuring safe and healthy work conditions is everyone's responsibility!

Sincerely,

Boris Gopka  
Executive Director

Date:

## Criteria for PPE Selection

### Types of PPE

**EYE AND FACE PROTECTION:** Employees must use this protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids, or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

**RESPIRATORY PROTECTION:** Employees must use appropriate respirators wherever they are exposed to inhalation hazards that exceed the established exposure limits (exposure to gases, vapors, dusts, mists, fumes or fibers).

**HEAD PROTECTION:** Hard hats must be worn when working in areas where overhead hazards are present.

**FOOT PROTECTION:** Employees must wear protective footwear when working in areas where there is a danger of potential foot injuries.

**HAND PROTECTION:** Appropriate hand protection must be used when employees' hands are exposed to the hazards listed below but not limited to:

- skin absorption of harmful substances;
- severe cuts or lacerations;
- severe abrasions;
- punctures;
- chemical burns;
- thermal burns and harmful temperature extremes.

## PPE by Type of Protection

### PPE – Head Protection

In accordance with the Construction Projects Regulation (O. Reg. 213/91), all workers must wear hard hats on construction projects.

#### **Purpose**

To protect the head against impact and against small flying or falling objects, as well as an electrical contact equal to 20,000 volts phase-to-ground.

#### **Standards**

Minimum standards, in accordance with Canadian Standards Association (CSA), are as follows:

- Z94.1-05: Class E, Type 1
- Z94.1-05: Class E, Type 2
- Z94.1-1992: Class E

The type and the class are indicated on the hat label or are sometimes stamped into the shell of the hard hat under the brim.

Type 1 and 2 protect the top of the head. Type 2 also protects against side impact and penetration.

#### **Reversible Hard Hats**

Hard hat may be worn facing backwards when:

1. They have a reverse orientation mark
2. If the task requires it (e.g. wearing a face shield)

#### **Use and Care**

Manufacturer instructions must always be followed.

Follow these guidelines to ensure optimal performance and protection:

- Hard hats must be inspected before every use: shell, suspension, and liner. All cracks, dents, cuts, or gouges must be identified. **IMPORTANT:** Damaged or worn hats and liners must be replaced immediately.
- No longer use a hat that has been struck by an object.
- Hard hats must not be stored in direct sunlight – to avoid premature aging and fragility.
- Every part of the hat should be cleaned with mild soap and water.
- The hat must not be altered in any way – painting, drilling of holes, etc.
- Hats must not be used for storage and transportation.
- No other hat must be worn underneath.
- When working at heights or in windy conditions, a chinstrap must be used.

- Hard hat must not be used beyond their stipulated service life. (Check what it is by contacting the manufacturer or reading the manufacturer's instructions.)
- When visibility is reduced, put retroreflective stickers or tape on a hard hat.

**IMPORTANT:** Such stickers or tape must be compatible with the surface material, not adversely affect the material, and not interfere with the ability to inspect the hard hat for defects. They should be placed at least 13 mm (1/2 in) above the edge of the brim.



## PPE – Eye Protection

Proper eye protection must be selected based on the specific construction hazard in order to help reduce the number and severity of eye injuries.

### Types of Hazards

1. Impact
2. Splash
3. Radiation (visible and invisible light rays).

### Classes of Eye Protectors

There are seven classifications based on the CSA Standard Z94.3-15: Eye and Face Protectors.

#### Class 1 – Spectacles:

In accordance with the CSA Standard Z94.3-15, Class 1 spectacles must incorporate side protection, either permanently attached or detachable.

#### Class 2 – Goggles:

Both types of goggles – eyecup goggles and cover goggles – must meet the CAN/CSA Z94.3-15 standard.

1. *Eyecup goggles:* These provide all-round protection by completely covering the eye socket. They have ventilation ports (which prevent fogging by allow air in) and adjustable or elasticized headbands. Some models have an adjustable chain bridge.
2. *Cover goggles:* These are designed to be worn over spectacles. They also have ventilation ports and adjustable or elasticized headbands

While both models keep out large particles, some goggles come with direct ventilation ports that prevent large particles from getting through. Others have indirect ventilation ports that keep out large particles, dust, and liquids.

#### Class 3 – Welding Helmets:

Such helmets protect the face and eyes against radiation and impact. There are two types of welding helmets:

1. *Stationary plate helmet:* These helmets have a single filter lens plate 51 mm x 108 mm (2 in x 4.25 in) in size, or a 114 mm x 113 mm (4.5 in x 5.25 in) in size. These are more suitable for those who wear spectacles.
2. *Lift-front or flip-up plate helmet:* These helmets have three plates or lenses:
  - a. A filter or shaded plate made of glass or plastic in the flip-up cover;
  - b. A clear thin glass or plastic outer lens to keep it clean;
  - c. A clear, impact-resistant plastic or glass lens mounted in the helmet itself.

There are also special models that include earmuff sound arrestors and air purification systems. For workers that need corrective keep together, special magnifying lens plates that have been manufactured to fixed powers are available.

#### Class 4 – Welding Hand Shields:

Such hand shields also protect the face and eyes against radiation and impact. There are no lift-front type models.

Since the user continually lifts and lowers the visor, Class 1 spectacles should be worn underneath to offer eye protection when the visor is lifted.

#### Class 5 – Hoods:

Non-rigid helmets or hoods come equipped with impact-resistant windows (normally made of plastic) and may include an air-supply system – ideal for use in confined spaces. Some have a collapsible construction, which is convenient for carrying and storing.

There are four types of hoods:

5A – Hoods with impact-resistant window

5B – Hoods for dust, splash, and abrasive materials protection

5C – Hoods with radiation protection

5D – Hoods for high-heat applications.

#### Class 6 – Face Shields:

Face shields come with a transparent window or visor to offer impact, splash, heat, or glare protection for the face and eyes. Since the user continually lifts and lowers the visor, Class 1 spectacles should be worn underneath to protect the eyes when the visor is lifted.

Some face shields come with an adjustable spark deflector or brow guard that fits on hard hats. Some have shaded windows which provides glare reduction. IMPORTANT: They should not be used when there is any hazard from UV or infrared radiation because they do not meet the requirements of CSA Z94.3-15 *Eye and Face Protectors* for ultraviolet and total heat.

There are three types of face shields:

6A – Face shields for impact, piercing, splash, heat, and glare protection

6B – Face shields for radiation protection. Similar to 6A but with a thicker shield. Also for low heat, splash, glare, and light, non-piercing impact protection

6C – Face shields for high-heat applications and light, non-piercing impact protection only (these normally have wire screen windows).

#### Class 7 – Respirator Facepieces:

For detailed information, see the PPE – Respiratory Protection section.

There are four types of respirator facepieces:

7A – Respirator facepieces for impact and splash protection

7B – Respirator facepieces for radiation protection

7C – Respirator facepieces with loose-fitting hoods or helmets

7D – Respirator facepieces with loose-fitting hoods or helmets for radiation protection.

## PPE – Hearing Protection

### Noise Regulation

In accordance with the regulation on noise O. Reg. 381, employers are required to protect workers from overexposure to noise.

If workers are exposed to levels above 85 dBA, engineering and administrative controls must be used to reduce noise at the source or along the path to the worker. If such controls cannot be applied, appropriate PPE must be used – Hearing Protection Devices (HPDs). Proper HPDs must be selected based on the jobsite conditions, and adequate training and instruction on their use and care must be provided to all workers involved.

### Noise Exposure Hazards

After prolonged exposure to noise, workers may develop the following problems:

- Noise-induced hearing loss (NIHL)
- Tinnitus (ringing in the ears)
- High blood pressure
- Fatigue

### Noise-induced hearing loss

Depending on factors such as noise level and duration of exposure, among others, either temporary or permanent hearing loss may occur. While the body will restore its hearing capacity in case of temporary hearing loss, with permanent hearing loss, such restoration is impossible.

### Noise Level Measurement

To better prevent hearing damage, noise levels must be measured to determine whether they are harmful and to implement the necessary controls.

A sound level meter (SLM) is used for making measurements. Sound intensity is measure in decibels (dB), and sound intensity is perceived as loudness.

Noise levels can't be added directly: two noise sources that produce 90 dB each have a combined output of 93 dB, not 180 dB. The combined output of 93 dB is actually a *doubling* of intensity.

Area noise measurement: This measurement is the first step in determining whether further measurements are necessary. It is done in a specific work area.

Personal noise measurement: This measurement determines how much noise a given worker is exposed to during his/her shift. It is done by using a noise dosimeter – a devices that has a microphone which is placed next to a worker's ear.

### Hearing Protection Devices (HPDs)

These devices must be used only if other controls – engineering and administrative – are not possible. HPDs act as barriers that reduce the amount of noise that reaches the sensitive inner ear. It is extremely important to consider fit, comfort, and sound reduction when choosing HPDs.

The most common types of HPDs are earplugs and earmuffs. Earplugs diminish noise by plugging the ear canal. Earmuffs cover the external part of the ear.

#### Earplugs:

The following must be kept in mind when using earplugs:

1. They should conform to the latest issue of CSA Standard Z94.2.
2. They must be fitted snugly in the ear canal. (Seek professional advice if there is severe discomfort initially or mild discomfort for more than a few weeks.)
3. Some ear canals cannot be fitted with plugs because of obstructions, unique shapes, or deformities. (The same individual may have ear canals of entirely different shapes).
4. Reusable earplugs should be washed daily with warm soapy water. They should be kept in a clean container when not in use.
5. If flanges are torn or otherwise damaged, earplugs should be replaced.

#### Earmuffs:

The following must be kept in mind when using earmuffs:

1. Earmuffs should conform to the latest issue of CSA Standard Z94.2.
2. The cup part of the earmuff should fit snugly over the entire ear and be held firmly in place by a tension band.
3. The cup and band should not be too tight and cause discomfort.
4. Before every use, the cup, cushion, and band should be checked for possible defects – cracks, holes, or leaking seals.
5. The band may require repair or replacement since its tension can be reduced over time.
6. Defective or damaged parts should be repaired or replaced as needed.

## PPE – Respiratory Protection

Dusts, gases, fumes, mists, vapours, and bioaerosols all pose a respiratory hazard.

The most preferred method of elimination of such hazards is a careful selection of materials and work practices. When that is not possible, engineering controls (fume exhaust systems and similar) are the next best choice. Respirators are the least preferred method of protection because they do not deal with the hazard at the source, and can be more unreliable due to poor fitting and maintenance. They may also be uncomfortable to wear.

## Respiratory Hazards

All the following are typical respiratory hazards on a construction site:

1. Gases are made up of individual molecules of substances, and at room temperature and pressure, they are always in the gaseous state.  
Common toxic gases are carbon monoxide from engine exhaust and hydrogen sulphide produced by decaying matter (in sewers and other places).
2. Vapours are formed by the evaporation of liquids. Common vapours are produced by solvents such as xylene, toluene, and mineral spirits used in paints, coatings, and degreasers.
3. Fumes consist of small particles formed by the condensation of materials that have been subjected to high temperatures. Common fumes are welding fume and pitch fume from coal tar used in built-up roofing.
4. Mists are formed by small droplets of liquid suspended in air. They are generated when paint, form oils, and other materials are sprayed.
5. Dusts are made of particles that become airborne when crushing, grinding, sanding, cutting, or demolition are done. There are two types of hazardous dust:
  1. fibrous dust from insulation materials (asbestos, mineral wool, and glass fibre)
  2. non-fibrous silica dust made during sandblasting, concrete cutting, or rock drilling.
6. Bioaerosols consist of airborne particles containing microbes (mould, bacteria, viruses, or pollen). When inhaled, they can cause infectious diseases (tuberculosis, etc.), respiratory infections, or allergic reactions.

## Health Effects

Depending on the type of effect they cause, inhalation hazard can be divided into the following types:

1. **Irritants** are substances that irritate the eyes, nose, throat, or lungs. Among them are fibreglass dust, hydrogen chloride gas, ozone, and many solvent vapours. With some materials (cadmium fume) the irritation leads to pulmonary edema. **NOTE: This effect may not be apparent until several hours after exposure has stopped.**
2. **Asphyxiants** cause an inadequate oxygen flow in the body. They can be classified as either *simple asphyxiants* or *chemical asphyxiants*.
  - a. *Simple asphyxiants* are gases or vapours that cause oxygen to be displaced, resulting in an oxygen-deficient atmosphere. Examples include nitrogen used for tank purging tanks (it displaces oxygen, which can lead to unconsciousness and even death for those who enter), and rusting or bacteria digesting sewage that consume oxygen.

- b. *Chemical asphyxiants* do not allow the normal transport or use of oxygen in the body. Two examples are carbon monoxide and hydrogen sulphide.
- 3. **Central nervous system depressants** are substances that interfere with nerve function, causing symptoms like headache, drowsiness, nausea, and fatigue. Most solvents are such depressants.
- 4. **Fibrotic materials** cause *fibrosis* (scarring of lung tissue in the air sacs). Asbestos and silica are examples of such materials.
- 5. **Carcinogens** can either cause or promote cancer in diverse body organs. Among such substances are silica, asbestos, and hexavalent chromium.
- 6. **Dusts** may only have significant impact if exposure is of high concentration and/ or long duration. Excessive exposure can be adverse in itself or can worsen existing conditions like emphysema, asthma, or bronchitis. Plaster dust, cellulose from some insulation, and limestone dust are some examples of potentially hazardous dusts.
- 7. **Biological hazards** include moulds, bacteria, or viruses. When inhaled, they can cause eye, nose and throat irritation, hypersensitivity pneumonitis, or asthma.
- 8. **Respiratory sensitizers** are chemicals such as isocyanates in spray foam insulation or certain wood dusts. They can cause asthma when inhaled.

### Respiratory Protective Equipment

The two basic types of respiratory protective equipment are air-purifying respirators and supplied-air respirators.

I. Air-purifying respirators: These devices purify air as it goes through them. There are non-powered and powered air-purifying respirators.

*Non-powered air-purifying respirators* – the air is purified as the wearer breathes in and out, drawing the air through the air-purifying filter, cartridge or cannister.

*Powered air-purifying respirators* – these include a blower carried by the wearer. It passes contaminated air through an air-purifying component and supplies the purified air to the wearer.

**NOTE:** These respirators should not be used where oxygen supply is low (less than 19.5%) and where there is a high concentration of contaminants.

#### *Types of filters used:*

1) **Particulate filters** – these filters are made for filtering solid particles such as dusts, fumes, or mists, and are available in different grades.

These filters have three designations: N (**N**ot resistant to oil), R (**R**esistant to oil), and P (oil-**P**roof).

- The N series of filters is suitable for airborne particles like wood dust, when there are no oil-based particles also in the air (useful when removing old lead paint, for instance).
- The P or R series is suitable for operations involving airborne oil particles, such as spraying form oil or putting down hot asphalt.

- The R series should only be used for an 8-hour single shift when solvent or oil mist is present in the air.
- The P series should only be used for the duration of time specified by the manufacturer.

**2) Gas/vapour cartridge filters** – these filters are made for absorbing or neutralizing gases and vapours. When these filters become full, they stop being effective. Three common types of filters are organic vapour cartridges, acid gas cartridges, and ammonia cartridges.

- Organic Vapour Cartridges normally contain activated charcoal. They remove vapours like toluene, xylene, and mineral spirits (found in paints, adhesives, and cleaners).
- Acid Gas Cartridges contain materials which absorb acids. They can be used for protection against hydrogen chloride, sulphur dioxide, and chlorine, but in limited concentrations.
- Ammonia Cartridges contain an absorbent which removes only ammonia gases.

**3) Combination particulate/gas/vapour cartridge filters** – these filters remove particulate matter, vapours, and gases from the air. They are used when there is more than one type of hazard is present or may develop.

**II. Supplied-air respirators:** These devices provide clean breathing air from an uncontaminated source, such as a special compressor located in a clean environment, or cylinders filled with compressed breathing air. Air quality should meet the requirements of CSA Standard Z180.1, *Compressed Breathing Air and Systems*.

The moisture content of supplied air should be limited to prevent fogging, corrosion, and freezing of regulators and valves. This will also prolong the service life of filters which are used for the removal of other contaminants.

The “pressure dew point” (the temperature at which moisture in compressed air will condense out as droplets or “dew”, at a given pressure) is important in relation to moisture and must be kept at least 5°C below the lowest expected temperature of the ambience. Water vapour can be removed from compressed air with a drying system or water-absorbing materials.

Types of Supplied-Air Respirators:

**1) Air-line unit**

This type of respirator contains compressed breathing air, portable supplied air, or a clean ambient air system. The user receives air into the respirator facepiece through a hose attached to the wearer’s belt. In case of emergency, it can be disconnected quickly.

**2) Self-contained breathing apparatus (SCBA)**

This type of respirator includes a cylinder of air carried by the wearer. The disadvantages of SCBAs are their bulkiness, weight, and the need for frequent cylinder changes.

### 3) Multifunctional unit (combination air-line and SCBA).

Such a combination of respirators is needed in confined spaces and other high-risk places that call for reserve protection.

The disadvantages of multifunctional units are the restrained mobility due to the trailing hose and the length of line available, as well as the danger of air-lines getting crimped or snagged on equipment.

Despite their more elevated cost, as compared to air-purifying systems, they provide much greater protection.

### Modes of Operation

Respirators can operate in three different modes:

1. **Positive pressure (or pressure-demand) mode:** In this mode, the pressure in the facepiece or hood always remains positive. When there is a slight decrease in positive pressure inside the facepiece, more air is supplied. In case of a leakage, it is directed outside of the facepiece.
2. **Constant-flow mode:** In this mode, air is delivered constantly. Powered air-purifying respirators (PAPRs) use a battery-powered fan to draw air through the filter and then blow it into the facepiece. Even though these provide more comfort than non-powered air-purifying respirators, they should never be used in oxygen-deficient conditions.

These respirators use a simple valve to control the flow of "clean" air from the compressor.

To minimize inward leakage of contaminated air and provide adequate breathing air, minimum flow rates of 170 litres per minute (6 cubic ft/min) for loose-fitting hoods or helmets and 115 litres per minute (4 cubic ft/min) for tight-fitting facepieces must be maintained.

3. **Negative pressure mode:** In this mode, air is delivered only when there is a slight negative pressure created in the facepiece. Contaminated air may leak inward around the facepiece, so these devices are now always appropriate in high-exposure conditions.

### Styles of Facepieces

Facepiece style is another determining factor in respirator classification. There is a variety of styles:

1. **Filtering Half-Facepieces:** These devices fit over the mouth and nose, rest on the chin, and are held in place by two straps.  
Usually, these are designed for one-time use. However, some more sophisticated versions that have adjustable straps and exhalation valves, may be used more than once, as long as they are not damaged.
2. **Hoods and Helmets:** These devices depend on continuous flow of large volumes of air instead of tight seals, to prevent inward leakage of contaminated air. They can be used with powered air-purifying and supplied-air systems.
3. **Full-Face Mask:** This style of mask covers the face completely. It consists of a moulded rubber or plastic frame and a clear visor, providing greater protection than other face masks. Such masks can be used with air-purifying, powered air-purifying, and supplied-air respirators.
4. **Half-Face Mask:** This style of mask is commonly used as an air-purifying respirator with one or more filters or cartridges attached to the facepiece. The silicone, thermoplastic, or rubber facepiece covers the mouth and nose, cups under the chin, and has two straps that hold it in place. It offers more protection than quarter-face masks because the chin cup provides a more secure fit.



## Assigned-Protection Factors

These factors are a measure of the anticipated level of protection provided when a respirator is functioning correctly, and when its user has been trained. The APF is assigned to most respirators and is used in the selection process to determine the maximum use concentration (MUC) for the respirator.

The MUC is the maximum level of an airborne contaminant that an employee will be protected from when wearing a respirator. To determine MUC, multiply the APF of the respirator or class of respirators by the occupational exposure limit (OEL) for that contaminant.

**An example:** the OEL for chrysotile asbestos in Ontario is 0.1 fibre/cm<sup>3</sup> of air. When using a half-mask respirator with N100 filters (APF=10), the MUC is 1 fibre/cm<sup>3</sup> (i.e., 10 (APF) \* 0.1 (OEL) = 1 (MUC)). If the concentration of asbestos becomes greater than 1 fibre/cm<sup>3</sup> during the course of work, a respirator with a greater APF must be used.

**Respirator efficacy:** The degree of protection depends on the type of respirator, style of facepiece, and principle of operation. Generally, supplied-air respirators provide better protection than air-purifying respirators; full-face masks do better than half-face masks; and positive-pressure devices protect more than negative-pressure types.

**Table 1: Assigned-Protection Factors (APF)**

Type of Respirator	Style of Facepiece	Mode	APF
Air-purifying	Filtering facepiece	Negative	10
	Half-facepiece	Negative	10
	Full-facepiece	Negative	50
Powered Air-purifying	Helmet/hood	Continuous	25/1000*
	Loose-fitting facepiece/visor	Continuous	25
	Half-facepiece	Continuous	50
	Full-facepiece	Continuous	1000
Supplied-air or Air-line	Half-facepiece	Continuous	50
	Full-facepiece	Continuous	1000
	Helmet/hood	Continuous	25/1000*
	Loose-fitting facepiece	Continuous	25
	Half-facepiece	Pressure-demand	50
	Full-facepiece	Pressure-demand	1000
Self-Contained Breathing Apparatus (SCBA)	Full facepiece or tight-fitting hood	Pressure-demand	10,000

Source: CSA Z94.4-11

## Respirator Selection

In order to select the proper respirator for a particular job, it is necessary to know and understand the following:

1. The characteristics of the contaminant(s)
2. The conditions of anticipated exposure
3. The equipment performance limitations
4. Any applicable legislation

**NOTE:** Facial hair and deep facial scars can interfere with the seal between respirator and face.

**IMPORTANT:** Before using or handling a hazardous product, the safety data sheet (SDS) for the type of respiratory protection required must be consulted. Under the Workplace Hazardous Materials Information System (WHMIS), an SDS must be available for every hazardous product.

In case of any doubt about the correct type of protection for a specific material and type of work, the manufacturer of the product, a supplier or manufacturer of respirators, or IHSA must be consulted. When seeking information on the type of respirator for use in specific situations, provide as much of the following information as possible:

- a) Name and form of the material (oil or non-oil). If the form is unknown, consider it an oil.
- b) Type of work to be done (e.g., painting, welding).
- c) Description of worksite conditions (e.g., inside a tank, outdoors).
- d) Exposure concentration, if known (e.g., 150 ppm of toluene).
- e) What will be done with the material (heating, spraying, etc.)
- f) Other materials being used in the vicinity.

The respiratory protection specialist will evaluate this information and compare it with the following additional data:

1. **The occupational exposure limit of the dust, gas, or vapour**, often referred to as the TLV<sup>\*</sup> or Threshold Limit Value\*. These values are used in conjunction with the assigned-protection factors listed in Table 15-1 to determine the maximum use concentration.
2. **The physical properties of the contaminant:**
  - a. **Vapour Pressure:** The maximum amount of vapour that can be generated under given conditions.
  - b. **Warning Properties:** Do not rely on such properties as irritation, odour, or taste to decide on cartridge/canister change out.
  - c. **Health Effects:** More protection is required when workers are exposed to cancer-causing materials.
  - d. **Filter Performance:** Filters can become overloaded in just a few minutes with some gases and vapours. Therefore, it is essential to know about the filtering material and its performance against specific gases and vapours.
3. **IDLH concentration:** A concentration considered to be Immediately Dangerous to Life or Health (IDLH). IDLH atmospheres can pose an immediate threat to life or health, or have a serious yet delayed impact on health (e.g., radioactive dust exposures). No one must enter such atmospheres without wearing SCBA or SCBA/air-line respirators.
4. **Possibility of skin absorption:** With some chemicals the amount of material that can be absorbed through the skin is of equal or greater concern than the amount of gas or vapour that can be inhaled. For these situations, supplied-air protective suits may be necessary.

5. **Eye irritation:** For contaminants that can cause eye irritation, a full-face mask must be worn, so that the worker can continue seeing well.

### Fit Testing and Seal Checks

Upon respirator selection, proper fitting is the next critical step, since one size does NOT fit all. A fit test MUST be conducted before the worker is asked to wear it.

#### *Fit Testing*

When to carry out a fit test:

1. Before the initial use of a tight-fitting respirator;
2. When changes occur to a user's physical condition that could affect the fit (weight change, or changes to facial or dental features);
3. When there is a change in the respirator (new make, model, or size);
4. When a respirator user experiences continued significant discomfort during use or difficulty in completing a successful user seal check;
5. When there is a change in PPE use that could affect the respirator (e.g., user now required to wear safety glasses);
6. At least every 2 years, generally.

Types of fit testing:

#### **1. Qualitative:**

Before carrying out a qualitative fit test, it should be confirmed that the respirator user can taste or smell the test agent being used.

1) **Irritant Smoke Test:** This test determines the fit of P100 particulate filter respirators. A cloud of irritant smoke is created around the wearer. Adjustments are necessary if leakage is detected.

**NOTE:** Since most such smoke clouds are very irritating to the eyes, nose, and throat, workers should keep their eyes closed during the test and back out of the smoke as soon as they notice any leakage or irritation.

2) **Iso Amyl Acetate (Banana Oil) Test:** The respirator is used with "organic vapour" cartridge filters. The respirator needs adjusting if the wearer smells the solution.

3) **Saccharin Test:** For this test, instead of banana oil, saccharin is used as the test material, and the respirator is equipped with a particulate filter. If the wearer tastes or smells the sweetness of saccharin, the fit needs adjusting.

4) **Bitter Solution Aerosol Test:** The respirator is used with any particulate filter. The wearer puts on a hood or test enclosure over his/her head and shoulders. Bitter solution is then sprayed into the hood or enclosure. It will be easily detected if it leaks through the face seal.

#### **2. Quantitative:**

The wearer uses a special respirator that has a probe mounted inside the facepiece. The fit of the respirator can be determined by any of the following:

- 1) comparing the amount of test aerosol outside the respirator to the amount inside the respirator;
- 2) comparing the amount of ambient aerosol outside of the respirator to the amount inside the respirator;
- 3) measuring the amount of pressure leakage from the respirator.

#### Risks of not conducting fit tests

**Negative-pressure respirators:** When using such respirators, gaps in the seal will allow contaminated air to enter the breathing zone.

**Positive-pressure respirators:** When using such respirators, the degree of protection provided to the wearer could be reduced due to significant outward leakage. In addition, "venturi effects" may allow air to escape in one area and draw contaminated air into the facepiece around the escaping air.

#### User Seal Checks

Every time a tight-fitting respirator is used, the seal must be checked by using the negative-pressure and positive-pressure method.

- 1) **Negative-Pressure Seal Check:** The wearer puts on the respirator and adjusts it to achieve a relatively comfortable fit. The user then blocks the air inlets with the hands or a plastic cover, and inhales gently and holds for five seconds. A properly fitting respirator should collapse slightly and not permit any air into the facepiece. In case of any leakage, the mask should be readjusted, and the test repeated until proper fit is achieved.
- 2) **Positive-Pressure Seal Check** — The wearer puts on the respirator and adjusts it to achieve a relatively comfortable fit. He/she then covers the exhaust port of the respirator and tries to exhale gently. The facepiece should puff away from the wearer, but no leakage should occur.

#### Respirator Maintenance

Respirators need regular maintenance. Follow these steps to ensure proper maintenance and optimal performance:

- 1) Filter change, by type:
  - a. **Dust/mist/fume filters:** Change these when there is noticeable resistance to normal breathing.
  - b. **Chemical cartridges:** Change these when indicated to do so by the end-of-service-life indicator or in accordance with the change-out schedule.
  - c. **Any filter** should be changed at the interval specified by the manufacturer or when damaged in any way.
- 2) Before using a respirator, inhalation and exhalation valves should be checked.
- 3) Any damaged part – facepiece, straps, filters, valves, or others – should be replaced with "original equipment" parts.
- 4) Facepieces should be washed following the manufacturer's instructions.
- 5) Each respirator should be used only by the worker it has been assigned to.

- 6) If the same respirator must be assigned to more than one worker, it should be disinfected after each use (NOTE: Only acceptable sanitizers/disinfectants must be used).
- 7) All supply hoses, valves, and regulators on supplied-air respirators must be checked, as specified by the manufacturer.
- 8) SCBA units and high-pressure cylinders of compressed breathing air should be used and maintained in accordance with current CSA Standards Z94.4: *Selection, Care and Use of Respirators* and Z180.1: *Compressed Breathing Air and Systems*.
- 9) Compressors and filtration systems used with supplied-air respirators must be maintained following the manufacturers' recommendations.
- 10) The manufacturer should be consulted for information on respirator cartridge change-out.
- 11) Respirators should be stored in a location away from dust, ozone, sun, heat, extreme cold, excessive moisture, vermin, damaging chemicals, oils, and grease. Extra caution should be taken to ensure rubber facepieces are not deformed.

### Approvals and Standards

The most commonly referenced standards for respiratory protection in North America are the test criteria used by the National Institute for Occupational Safety and Health (NIOSH), which is a U.S. government agency that tests and approves respiratory protective equipment and publishes a list of approved devices annually.

IHSA recommends that only NIOSH-approved equipment be used for protection against respiratory hazards.

The CSA has issued two standards pertaining to respiratory protection, which should be reviewed by the person who is responsible for the respirator program:

- Z94.4 *Selection, Care and Use of Respirators* offers recommendations on these three aspects.
- Z180.1 *Compressed Breathing Air and Systems* lists the criteria for air purity and delivery systems.

## PPE – Hand and Skin Protection

Exposed hands and skin are susceptible to physical, chemical, and radiation hazards. Personal hand/skin protection is often the only practical means of preventing injury.

### *Physical hazards*

Leather gloves are the best protection against physical hazards, such as heat, splinters, or sharp or jagged edges on materials and tools. Cotton gloves or gloves made of other materials may be used for light-duty jobs.

Anti-vibrations gloves must be used in conjunction with power tools with built-in vibration-reducing components when there is danger of vibration (caused by vibrating tools like jackhammers, grinders, riveters, compactors) being transferred from tools and equipment to the worker, which can affect hands and arms.

If the worker is not protected, he/she may develop hand/arm vibration syndrome (HAVS) which causes the following changes in fingers and hands:

- Circulation problems – whitening or bluish discoloration, especially after exposure to cold;
- Sensory problems, such as numbness and tingling;
- Musculoskeletal problems, such as difficulty with fine motor movements.

Successful prevention of this disease requires cooperation between employers and workers.

#### **Employers**

- Provide anti-vibration gloves and power tools with built-in vibration-reducing components.
- Ensure proper tool maintenance (higher vibration levels will occur when worn grinding wheels or tool bearings are used).
- Review exposure times and allow rest breaks away from vibrating tools.
- Train workers in prevention techniques.

#### **Workers**

- Wear appropriate clothing in cooler weather to maintain core body temperature.
- Wear gloves whenever possible.
- Wear anti-vibration gloves when using power tools and equipment.
- Avoid smoking (it contributes to circulatory problems).
- Report any poorly functioning tools immediately.

### *Chemical hazards*

Corrosive or toxic chemicals present a chemical hazard to skin.

The safety data sheet (SDS) must be reviewed for any hazardous chemicals being used on a jobsite to determine whether gloves are needed and what kind. An SDS must be available on site for every hazardous product.

Table 2 identifies the type of glove that must be worn for protection against chemicals that can cause harm to the skin. This information should be used if the SDS does not specify the type of gloves to be worn.

**Table II: Assigned-Protection Factors**

Chemical Name	Glove Selection
Acetone	Butyl Rubber
Cellosolve	PVA, PVC, Neoprene
Cellosolve Acetate	PVA, PVC
Cyclohexane	NBR, Viton®
Hexane	Neoprene, NBR, PVA
Methyl Alcohol	Neoprene, Rubber, NBR
Methyl Chloroform	PVA, Viton®
Methyl Chloride	PVA, Viton®
Methyl Ethyl Ketone	Butyl Rubber
Methyl Isobutyl Ketone	Butyl Rubber, PVA
Mineral Spirits	Neoprene
Naphtha	NBR, PVA
Perchloroethylene	NBR, PVA, Viton®
Stoddard Solvent	NBR, PVA, Rubber
Toluene	PVA, Viton®
Turpentine	PVA, NBR
Trichloroethylene	PVA, Viton®
1, 1, 1 Trichloroethane	PVA, Viton®
1, 1, 2 Trichloroethane	PVA, Viton®
Xylene	PVA, Viton®
<b>PVA</b> = Polyvinyl Alcohol <b>PVC</b> = Polyvinyl Chloride <b>NBR</b> = Nitrite Butyl Rubber <b>Viton®</b> = Dupont tradename product	

**IMPOTANT:** Gloves do not protect against all hazards. Some solvents, degreasers, and other liquids can penetrate and/or dissolve rubber, neoprene, or PVC.

#### *Ultraviolet radiation.*

Long-term health risks of UV exposure include skin cancer, melanoma being the most dangerous kind. Melanomas most often appear on the upper back, head, and neck (as well as tips of the ears and lips, which are often unprotected) – areas that are frequently unprotected from exposure to the sun. Since skin cancer appearance is normally delayed between 10 and 30 years, young workers must be fully aware of the risks of long-term unprotected exposure to UV radiation.

Exposure to indirect UV radiation in addition to the harmful effects of the sun's direct rays, occurs when workers are on or near a surface that reflects sunlight. Such surfaces include concrete, water, unpainted corrugated steel, building glass, and aluminum. UV radiation is also intensified by the hard hat itself, as it reflects the rays.

Some individuals are at a higher risk of developing skin cancer due to the following:

- Fair skin
- Blistering sunburns in childhood and adolescence
- Family history of melanoma

- Many freckles and moles

**NOTE:** Workers without access to shades or working at heights run a greater risk of developing cancer due to higher exposure rates.

**Employers Can Do the Following:**

- Provide sunscreen an SPF of 30 or higher.
- Ensure adequate shaded areas for workers on breaks and lunch.
- If possible, rotate workers to shaded areas of the jobsite.
- Educate workers on the hazards of UV radiation.
- Ensure that workers use UV-absorbent safety glasses.

**Workers Can Do the Following:**

- Apply sunscreen with SPF of 30 or greater to ALL exposed skin areas 20 to 30 minutes before going out in the sun. Reapply it every two hours.
- Use an SPF 30 or higher sunscreen lip balm and reapply every two hours.
- Wear UV-absorbent safety glasses (CSA-approved polycarbonate glasses have this feature).
- Wear clothing that covers as much of the skin as possible, made of tightly woven material.
- Take breaks and have lunch in a shaded area.
- For those that sweat heavily, sunscreen should be reapplied more often. Additional dry clothing should be available, since wet clothes do not block UV rays as efficiently.
- UV protection can be added to the back of the neck by using a fabric neck protector that clips onto the hard hat.
- A wide-brimmed hard hat designed to protect the face and neck from the sun can be worn. To reduce reflective UV rays, a glare guard can be added under the peak of the hard hat.
- Skin should be examined regularly for any unusual changes. The most important warning sign for skin cancer is a spot on the skin that is changing in size, shape, or colour.

**NOTE:** The majority of skin cancers are preventable.



## PPE – Foot Protection

All workers must wear protective footwear – either a safety shoe or safety boot – at all times when on jobsite, in accordance with Section 23 of the Construction Projects regulation (213/91).

Such footwear must have the following characteristics:

- A box toe that is adequate to protect the wearer's toes against injury due to impact, capable of resisting at least 125 joules impact.
- A sole or insole that is adequate to protect the wearer's feet against injury due to puncture, capable of resisting a penetration load of 1.2 kilonewtons when tested with a Deutsche Industrie Norm standard pin.

If used properly, a CSA-certified Grade 1 workboot meets the requirements of this regulation.

### Grade 1 Workboots

One of three CSA grades, Grade 1 is the only one allowed in construction due to the highest level protection it offers. A steel toe protects against falling objects, and a steel insole prevents punctures to the bottom of the foot.

Grade 1 boots can be identified by the following markings:

- A green triangular patch with the CSA logo, on the outside of the boot.
- A green label indicating Grade 1 protection, on the inside of the boot.

Grade 1 boots are also available with metatarsal and dielectric protection. A white label with the Greek letter Omega in orange means that the boot protects against electric shock under dry conditions.

### Selection and Fit

Grade 1 boots are available in various styles and sole materials for different types of work (Grade 1 rubber boots may be better suited for sewer and watermain or concrete work than leather boots.).

Boots should provide ample "toe room" (toes about 1/2 inch back from the front of steel box toe cap when standing with boots laced).

When fitting boots, heavy work socks must be taken into consideration. If extra sock liners or special arch supports are to be worn in the boots, insert these when fitting boots.

### Care and Use

Lacing boots military style allows them to be removed faster. In an emergency, the surface lace points can be cut, quickly releasing the boot.

In cold weather, feet should be kept warm by wearing a pair of light socks covered by a pair of wool socks. Feet should be checked for frostbite from time to time.

To help prevent ankle injuries, high-cut (260 mm or 9 in) or medium-cut (150 mm or 6 in) CSA Grade 1 workboots should be used. The higher cut helps support the ankle and provides protection from cuts or punctures.

Workboots should be cleaned regularly and checked them for damage and wear and tear. When footwear becomes defective or worn out, it will no longer protect the feet properly and must be replaced.

## PPE – High-Visibility Protection

The Construction Projects regulation stipulates that any worker who exposed to vehicular traffic on a jobsite must wear a high-visibility garment that covers the upper body. Section 69.1 of O. Reg. 213/91 provides the specifics. The CSA standard for this type of clothing can also be followed.

CSA Z96-15— High-Visibility Safety Apparel specifies how this type of clothing should reflect light, what colours can be used, and how much of it a person needs to wear. Advice on the selection, use, and care of high-visibility safety material is also provided, as well as recommendations for hazard assessments.

### Choosing High-Visibility Clothing

There are two main things to consider when choosing to high-visibility clothing: the background material and retroreflective stripes or bands.

#### 1. Background Material

Construction Regulations: According to the construction regulations, background material must be fluorescent blaze or international orange in colour. Fluorescent blaze (safety orange) is used on road signs and hunting gear. International orange has a darker, more reddish tone.

This background material gives workers the best chance to be seen by drivers and equipment during daytime.

Even on a cloudy day or at dusk or dawn, fluorescent colours will appear brighter. Since orange is a complementary colour to blue, it provides the best contrast against the colour of the sky and most other background colours.

CSA Standard: This standard allows some background colours other than orange. They are accepted by the Ministry of Labour (MOL) and considered to be compliant.

#### 2. Retroreflective Stripes or Bands

Such stripes or bands that are required on high-visibility clothing also help increase worker visibility but are more effective at night or in low-light conditions. Retroreflective stripes reflect the light from oncoming headlights back to the driver or operator, ensuring that a worker can be seen in the dark.

In accordance with the regulations, these stripes must be both retroreflective and fluorescent. The front and the back of the garment must have two yellow stripes that are 5 cm wide. The yellow area must be at least 500 cm<sup>2</sup> on the front and 570 cm<sup>2</sup> on the back. On the front, the two stripes must be vertical, centred, and approximately 225 mm apart (as measured from the centre of each stripe). On the back, they must be arranged in a diagonal "X" pattern.

For night-time work, additional stripes or bands are required on the arms and legs (fluorescent orange coveralls with retroreflective bands or stripes attached are one option).

### Risk Assessment

Engineering and administrative controls that control hazards at the source or along the path (barriers between workers and vehicles) must be the first option, followed by high-visibility clothing.

When PPE is the best option, jobsite-specific risks and hazards must be assessed before choosing the type of high-visibility clothing workers will require. Those who require greater visibility, should wear clothing that is highly visible under those particular work conditions (such as roadwork).

## PPE – Fall Protection

Fall protection is required for working at heights and with certain other hazards present, as explained below.

Whenever a task requires fall protection, corresponding CSA approved and up-to-date fall arrest equipment will be provided to each employee: safety harness, lifeline, and lanyard and rope grab.

The fall arrest system must be inspected and maintained after each use to make sure there are no cuts or frayed areas in this equipment. After a fall, all components of the fall arrest system should be discarded.

Training on fall arrest equipment must be provided by a competent instructor. It will include the Basics of Fall Protection program issued by CSAO, which has been approved for use by the Ministry of Labour of Ontario.

### **Mandatory Fall Protection**

All supervisors and workers must become familiar with Section 26 of the *Regulations for Construction Projects* which outlines the circumstances where fall protection is required.

Fall protection is required where a worker is exposed to any of the following hazards:

1. Falling more than 3 metres.
2. Falling more than 1.2 metres, if the work area is used as a path for a wheelbarrow or similar.
3. Falling into operating machinery.
4. Falling into water or another liquid.
5. Falling into or onto a hazardous substance or object.
6. Falling through an opening on a work surface.

Section 26.1 (1) and (2) of the Construction Regulations states that:

- 26.1 (1) A worker shall be adequately protected by a guardrail system that meets the requirements of subsections 26.3 (2) to (8).
- (2) Despite subsection (1) if it is not reasonably possible to install a guardrail system as that subsection requires, a worker shall be adequately protected by at least one of the following methods of fall protection:
1. A travel restraint system that meets the requirements of section 26.4
  2. A fall restricting system that meets the requirements of section 26.5
  3. A fall arrest system, other than a fall restricting system designed for use in wood pole climbing, that meets the requirements of section 26.6
  4. A safety net that meets the requirements of section 26.8

When in doubt about what type of fall protection is required for a particular situation, supervisors must be consulted.

## PPE, as required per Work Area and Job Type

### All Jobsites

The following personal protection equipment (PPE) is required:

1. Hardhat
2. Goggles (for protection against chips and dust)
3. Face shields (splash protection)
4. Respiratory masks (round masks that cover nose and mouth – to be used when cutting/chipping/sawing, as protection against construction dust)
5. Gloves:
  - a. latex – for any material that can irritate skin;
  - b. compression gloves –for shock absorbing when using chipping guns;
  - c. leather – for handling any splintering material;
  - d. winter gloves – for cold temperatures.
6. Safety boots

### Work at Heights and in Confined Spaces

In addition to the abovementioned PPE, a safety harness and lanyard are also required.

### Work with Cement Dust

In work areas, such as elevator shafts, garages, hospitals and clinics, stairs, utility rooms, and tunnels – where cement dust is created in an enclosed space, a half-face mask with filters on sides is required.

### Spray-On Applications

When chemical products must be applied by spraying, a full-face mask is required.



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## Preventative Maintenance Program

2021

2<sup>nd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Preventative Maintenance Program

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a Preventative Maintenance Program for our facilities (office), tools, equipment, and vehicles. The following are regularly inspected and maintained, in accordance with legislated requirements and/or manufacturer guidelines, as applicable:

Tools: chain saws, circular saws, power tools, propane torch, portable grinders, extension cords.

Equipment: generators, water pumps, injection pots, pressure washer, cement mixer, portable scaffolds, and floor concrete grinders.

Vehicles: 2016 Ford E450, 2012 Ford Transit, 2018 Ram ProMaster, and 2014 Nissan NV200.

### **Maintenance – Scheduling and Records**

We have established a system for scheduling and maintaining records of all maintenance work. The records must demonstrate all the maintenance work that was carried, as per legislated requirements and/or manufacturer guidelines, by clearly outlining the steps taken to correct any issues.

Inspection and maintenance must be performed by a qualified worker (made evident by his/her training credentials).

### **Defective Tools**

A defective tool must NOT be used at any time.

Tools must be inspected before use and, if found defective, the following procedure must be applied:

#### Workers:

1. The tool must be marked as “DEFECTIVE – DO NOT USE!” and removed from the work area.
2. Supervisors must be notified about the damaged tool.

#### Supervisors:

1. Supervisors must receive the damaged tool and arrange for its repair, if applicable.
2. When the repaired tool is returned, supervisors must make sure it is in working condition.

Safety is everyone’s responsibility, and timely maintenance is one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Preventative Maintenance Program – Facilities

At Joint Seal Waterproofing, we have established preventative maintenance plans to prevent deterioration or damage to our facilities, which include the office and the warehouse. Both the exterior and the interior of our facilities are inspected to ensure their optimal working conditions.

### Exterior

To ensure that the building where are office and warehouse are located is in safe, working conditions, the following will be done on a regular basis:

1. Walking the perimeter to check the condition on walls (looking for cracks) and windows (to make sure none are broken or leaking).
2. Checking the condition of the roof.
3. Checking the condition of the parking lot and cleaning up any trash or debris. Should there be any large pothole or cracks, they must be fixed.
4. Inspection of locks to make sure they lock and unlock easily.
5. Check that all lights are working properly; replace any unfunctional bulbs.

### General Building and Interior

Building interior (office and warehouse) is also checked to ensure it is in safe, working conditions. The following are done regularly:

1. Checking the condition of floors, ceilings, and walls.
2. Inspection of locks to make sure they lock and unlock easily.
3. Ensure that all exits are clearly marked.
4. Check that all lights are working properly; replace any unfunctional bulbs.
5. Carry out pest inspections and apply treatments, if needed.
6. Ensure that all passageways are free of obstacles or trash.
7. Test the fire alarm system and sprinkler system.

### Building Systems

The following apply for any workspace owned and operated by the employer:

1. Electrical system is checked for any loose wires or fixtures. A licensed electrician is hired to do any necessary repairs.
2. Plumbing is inspected for leaks, water damage, and loose fixtures. A licensed plumber is hired to do any necessary repairs.
3. HVAC system is inspected.
4. Roof inspection – twice a year and after adverse weather.



## Preventative Maintenance Program – Tools, Equipment, and Vehicles

To ensure the effectiveness of our preventative maintenance program in reducing the risk of injury, damage, and lost productivity:

- All workers will be trained on the proper use of tools, equipment, and vehicles.
- All tools, equipment, and vehicles will be inspected and maintained, as stipulated by the corresponding regulations and/or manufacturer's requirements.
- Detailed records will be kept to ensure all inspections and maintenance are done on time.

### **Maintenance Personnel Qualifications**

All maintenance must be done by qualified individuals (whether they are company employees or contractors) – they must demonstrate appropriate skills, accreditation and/or certification.

### **Records**

A record-keeping system is part of our preventative maintenance program. It consists of inventories, schedules, and documentation on the work that was done, including the dates and the responsible personnel.

### **Monitoring**

Monitoring is done at two levels: responsible employees and management. Those employees that are responsible for tool, equipment, and vehicle operation and maintenance, must make sure that proper inspection and maintenance are being carried out as stipulated and scheduled. Management must monitor that the entire maintenance program is functioning properly in order to ensure the correct and safe functioning of tools, equipment, and vehicles.

### **Scheduled Inspections and Maintenance**

All tools, equipment, and vehicles must be inspected and maintained in accordance with the corresponding regulations and manufacturer guidelines. An inspection must be done prior to use, and maintenance should be scheduled in accordance with manufacturer guidelines. Records of all inspections and maintenance are to be completed and maintained for review and approval.

All maintenance done on company grounds must be carried out only in approved areas. Any spills and leaks from equipment must be cleaned up promptly.

#### ***REMINDER: Always Use Hand and Power Tools Safely***

- 1. Select the right tool for the job.*
- 2. Keep tools in good condition.*
- 3. Use tools the correct way.*
- 4. Keep tools in a safe place.*

## Tool Maintenance

The following tools undergo regular inspections: chainsaws, circular saws, power tools, propane torches, portable grinders, and extension cords. If the tool is damaged and repair is not the most optimal choice, the tool is replaced.

### Chainsaws

To ensure the chainsaws are in optimal conditions, certain preventative maintenance actions should be done on a daily, weekly, or monthly basis.

#### Daily

1. Test the throttle trigger.
2. Monitor safety features – chain break and throttle trigger lockout.
3. Keep the air filter clean.
4. Rotate the bar before each use – for more even wear and tear.
5. Check the drive sprocket for wear. Replace if worn out.
6. Inspect the starter and the starter cord; if there is any damage, have it serviced.
7. Tighten any loose parts.

#### Weekly

1. Check the anti-vibration elements to make sure they are not too soft or torn.
2. Lubricate the clutch drum bearings.
3. Inspect the bar with the chain removed. If there are any burrs, file them.
4. Check the spark plug to ensure it is clean, and the gap is 0.5 mm.
5. Inspect the starter: clean the flywheel fins and check that the recoil spring is working normally.
6. Clean the cooling fins for optimal heat distribution and cooling.
7. Clean the carburetor, air box, and the screen in the muffler. Replace the muffler, if needed.

#### Monthly

1. Check the chain brake band (after removing the plastic cover from the bar and the chain).
2. Check the clutch (with the cover still off) – inspect its center, the clutch drum, and the spring.
3. Inspect the fuel filter (replace, if needed) and clean the outer part of the carburetor.
4. Check all the wiring, cables, and plugs for proper connection.
5. Clean the inner part of the fuel tank.

### Circular Saws

To ensure the circular saws are in optimal conditions, certain preventative maintenance actions should be done on a regular basis.

1. To make sure the blade does not rust or pit, avoid excessive moisture or humidity.
2. Clean the blade after each use: when materials accumulate on it, more push-through force will be required, which increases heat due to added friction.

3. Avoid overheating by keeping the blade at a proper distance when cutting. If the blade gets overheated, a thermal crack might appear in the carbide, which will cause tip fragments to fly backward.
4. Never use a wire brush when cleaning to avoid damage; use a nylon or a brass brush instead.
5. Never put the blades on steel or cement surface to avoid dulling the blade.
6. Use the correct shipping container to avoid blades rubbing against each other and getting chipped.

## Portable Grinders

To ensure the portable grinders are in optimal conditions, inspection and preventative maintenance actions should be done on a regular basis.

### Inspection

1. Spindle, wheel flange and lock nut:
  - a. Check that the lock nut is tight, as well as the screws that secure the spindle and wheel flange.
  - b. Check that none of these parts have a crack. If there is one, the wheel could come off during use.
  - c. Check that the spindle or the wheel flange is not deformed. If they were, the wheel would wobble, which would make the motor work harder, decreasing its useful life. It could also cause kickback during cutting.
  - d. Check for smooth movement by spinning the wheel flange around the spindle. There should be no rough movement, and the lock nut should fit tightly and not be stripped.
2. Handles and guards:
  - a. Make sure the handle is tightly attached to the grinder.
  - b. If a handle has padding or insulation, examine it for cracks.
  - c. Make sure the guard is tightly attached to the grinder and is in good condition.
3. Power supplies (both for corded and cordless grinders):
  - a. Check the cord for any cracks, nicks or other damage to make sure that no wires are exposed.
  - b. Check the battery for charge and proper connection to the grinder.
4. Accessories (wheels):
  - a. Check the wheel. If worn out, replace it. A worn-out wheel can damage the grinder and hurt the worker due to kickback.
  - b. Check that the wheel fits easily and is held in place properly by the wheel flange when tightened.
  - c. If there is any suspicion of damage to the wheel, replace it.
  - d. When a problem is found, use identical replacement parts.

## Maintenance

Cleaning the grinder after every use, together with timely and regular maintenance, will prolong its useful life.

1. Maintenance on:
  - a. Air vents – remove any debris by blowing them out with compressed dry air (once a week minimum recommended). Make sure the compressed air is used at under 30 psi, with guarding and PPE in place.
  - b. Switch levers – these must be kept clean and free of debris. No pointed objects should ever be put into the openings.
  - c. Liquid wash – the grinder must never be submerged into liquid. Use a cloth dampened with mild soap and water.
2. Preventing kickback will prolong the useful life of a grinder and prevent operator injuries. Do the following to prevent kickback or to at least minimize its effects:
  - a. Hold the grinder firmly. Brace yourself to be able to resist kickback in case it happens.
  - b. Use the secondary handle to better control the grinder. NEVER put your hand near a rotating accessory.
  - c. Stay away from the area to where the tool would kick back to, as much as possible.
  - d. Be extra careful when working on sharp edges or corners, avoiding bouncing and snagging.
  - e. A toothed saw blade or saw chain woodcarving blade should not be attached, as they are more likely to cause kickback.

## Chipping guns

To ensure the chipping guns are in optimal conditions, inspection and preventative maintenance actions should be done on a regular basis.

1. Do not press too hard on the tool while working.
2. Choose the correct type of bit based on the material being drilled and the size of the rotary hammer (chipping gun).
3. The end of the bit that goes into the chipping gun must be kept clean to prevent tool holder failure and jamming.
4. To prevent premature wear of the bit holder, grease the bit shank every time bits are changed.
5. Only manufacturer-recommended grease should be used. Weight and viscosity guidelines should be followed.
6. Follow the alerts provided by the tool's LED service lights.

## Caulking guns

To ensure the caulking guns are in optimal conditions, inspection and preventative maintenance actions should be done on a regular basis.

1. Keep the gun clean – remove the caulking tube after every use and clean the gun thoroughly, to prevent caulk and dirt buildup. Cleaning should be done with a brush or a wet cloth.

2. Load and unload the gun carefully – make sure to use caulking tubes of proper size and do not force them into the gun.
3. Keep the ratchet lubricated – this will make it easier to pump the caulk and will reduce buildup, making it easier to clean.
4. Store the gun in a cool, dry place – this will prevent damage to the tool.
5. Inspect the gun for damage – look for cracks and broken parts.
6. Remove excess caulk – this should be done before it hardens to make the cleaning easier, and the gun will function properly.
7. Store the caulking tubes correctly – if the tube was not used entirely, seal any gaps on the tube to prevent caulk hardening.

### Propane torch

To ensure the propane torches are in optimal conditions and can be used safely, inspection and preventative maintenance actions should be done on a regular basis.

#### Inspection

Equipment must be inspected and readied before a propane torch is used:

1. Check the expiration date on the cylinder prior to use.
2. Cylinder should be checked for damage.
3. Protective collar should be checked for damage.
4. Foot ring should be checked for rust.
5. Hoses, regulators, valves, gauges, and fittings should be checked for damage, wear, and leakage.  
Only soapy water may be used when checking for leaks.

If any part of the equipment is damaged or is leaking, repair or replace it before using the torch.

#### Transportation

Safe practices must be followed when transporting propane cylinders:

1. All cylinders must be secured before being moved. All material in the vehicle's cargo compartment must also be secured so that the cylinders do not get damaged.
2. Propane cylinders must never be transported together with explosives, poisonous gases, poisonous or corrosive liquids, or radioactive materials.
3. Damaged cylinders must NEVER be transported.

## Equipment Maintenance

To ensure safe and efficient performance, all equipment must be maintained and inspected regularly.

General requirements for equipment maintenance include:

- Obtaining a copy of the maintenance schedule recommended by the manufacturer.
- Ensuring that maintenance is performed as stipulated.
- Ensuring that the maintenance is done by competent individuals (e.g. licensed mechanic).
- Keeping records of maintenance/service conducted.
- Specifying who is responsible for overseeing equipment maintenance and where the records are kept.
- Setting up a system for removal and tagging of damaged or defective tools and equipment.

The following equipment undergoes regular inspections and maintenance: generators (gasoline powered), water pumps, injection pots, portable pressure washer, small cement mixer, portable scaffolds, and floor concrete grinders. If equipment is damaged and repair is not the most optimal choice, new equipment is purchased.

## Generators

To ensure the gasoline-powered generators are in optimal conditions and are safe to use, inspection and preventative maintenance actions should be done on a regular basis. Safe practices must be followed each time such generators are used.

1. Before using a gasoline-powered generator, make sure everything is connected properly.
2. Generators must never be used indoors, even when a door is open.
3. Never “backfeed” power from the generator using a dual male-ended extension cord. Only a transfer switch is a safe alternative to multiple extension cords.
4. Never refill the fuel tank until the engine cools down, since the fuel tank is located on top of the motor. Allow the engine to cool for 15 minutes.
5. The best practice is to use two 5-gallon cans to refill the tank safely. High-quality steel gas cans with a trigger control valve are preferable.
6. Sufficient motor oil and filters must always be available in case of extended use. The first oil change is due after 25 hours; after that, oil needs changing every 50 to 60 hours.
7. Cord length should be limited (to less than 100 feet), even when using heavy-duty, 12-gauge, outdoor-rated extension cord, to prevent premature appliance motor and compressor burnout.
8. Do not let the generator run out of gas, as that will drain the residual magnetic field from the generator coils, and the generator will not start once it is refilled. It will have to be repaired.
9. Use fresh stabilized gas to prevent gum buildup.

### Water Pumps

To ensure the submersible water pumps are in optimal conditions and are safe to use, inspection and preventative maintenance actions should be done on a regular basis.

**IMPORTANT:** Before any maintenance is done, follow the safety procedures on lockout/tagout.

1. Check for any loose or faulty electrical connections within the control panel.
2. Check amperage draw on all phases of the motor (in Amps).
3. Check condition and operation of leakage and bearing sensors (if equipped).
4. Change the oil.
5. Check the pump for worn or loose impeller or propeller.
6. Check impeller wear rings (both rotating & stationary).
7. Adjust clearances, whenever needed, to ensure optimal operation.
8. Check for any unusual noise in the upper and lower bearings.
9. Check if power and control cables have not been damaged.
10. Check that the shaft rotates correctly.

### Injection Pots

To ensure the injection pots are in optimal conditions and are safe to use, inspection and preventative maintenance actions should be done on a regular basis.

These pots are made of high-pressure resistant steel plate, with the anti-rust treated surface. There are two kinds of tanks. Upper type tanks are used for regular paint, while lower type tanks – for high viscosity materials. They also come in air-power automatic type and manual type.

**IMPROTANT:** The maximum pressure must not exceed the allowed scope, as specified in the table below.

Model	Use	Volume	Pressure	Operation Form	Painting Outlet	Material Tank Size	N.W.	G.W.
		(L)	Mpa(kgf/cm <sup>2</sup> )			(ØmmXmm)	(kg)	(kg)
RT-10AS	Mass	10	0.3(3.0)	Automatic	1/4x1	248x185	18.3	19.9
RT-20AS	Amount	20			1/4x2	292x365	23.7	26.3
RT-40AS	Spary (Stainless)	40	0.09(0.9)			350x395	31.3	34.9

### Portable Pressure Washers

To ensure the pressure washers are in optimal conditions and are safe to use, inspection and preventative maintenance actions should be done on a regular basis.

**IMPORTANT:** When using electric power washers, all electrical connections must be kept dry and off the ground. Plugs must NEVER be touched with wet hands.

### *Before Use*

Before beginning pressure washing, do the following:

1. Check the water inlet screen. Clean it if dirty or replace it if damaged.
2. If there is an inlet screen in the wand extension, check it for potential clogging. Clean it if dirty or replace it if damaged.
3. Check the spray gun, wand extension, and spray tip. Ensure that all connections are secure, including the one to the high-pressure hose.
4. Test the spray gun trigger and trigger lock. Replace the spray gun if not functioning correctly.
5. Check the high-pressure hose to see if there are cuts, leaks, bulges or other damage. Inspect the hose couplings. If the hose is damaged, follow manufacturer's guide for replacement procedure.
6. Check the detergent siphoning tube for potential clogging. Clean it if dirty. If the detergent system has a filter, it should be checked.
7. The hose needs to be flushed out before being connected.

### *After Use*

After pressure washing, do the following:

1. To rinse detergent from the pressure washer, remove the detergent siphoning tube from the detergent supply and set the spray to low pressure. Run water through the system for one or two minutes.
2. To relieve pressure, turn off the pressure washer and the water supply. Unplug the machine from the electrical outlet. Drain it until the water stops flowing, making sure to point the spray gun away.
3. Engage the trigger lock, allowing the pressure washer to cool down.
4. Drain water from the hose, spray gun, wand extension and high-pressure hose, after disconnecting them.
5. To remove any remaining water from the pump, turn the machine on until the water exits the pump and then turn it off immediately.
6. Remove any debris.

### *Other Maintenance*

Pressure washer manual should be checked for other maintenance procedures, including the following:

1. Clearing clogs in the spray tip or adjustable nozzle.
2. Lubricating the connections for the hose, spray gun and wand extension.
3. Replacing O-rings in the water-inlet, high-pressure hose and spray-gun connections.
4. Cleaning debris from the cooling vents.
5. Inspecting the muffler and spark arrestor (if any).

### *Long-Term Pressure Washer Storage*

If the pressure washer will be stored at colder temperatures or for periods longer than a month, the following should be kept in mind:

1. Follow the same maintenance steps as after any use.
2. Store the machine in a dry area, protected against extreme temperatures.



3. Use a pump lubricant/antifreeze, which helps prevent damage from mineral deposits in addition to lubricating seals and pistons, as well as protecting the machine against freezing.
4. Pressure washers should be protected with a cover that holds in no moisture.

### Cement Mixers

To ensure the cement mixers are in optimal conditions and are safe to use, inspection and preventative maintenance actions should be done on a regular basis.

Following these steps will ensure proper performance:

1. Mixes must be cleaned after every use. Use a water hose to wash away cement before there is any concrete buildup.
2. If concrete does build up, use a pressure washer to remove it. If that fails, chip off the buildup.
3. Keep the motor clean by using an air compressor to blow out cement and any other dust particles.
4. Grease the mixer parts and pulley to prevent damage from friction and extend the lifespan of the concrete mixer.

### Portable scaffolds

To ensure safe operation, maintenance and inspection procedures must be followed before and during scaffold use.

#### *Before Installation*

The location where scaffolding is to be placed is to be checked for the following:

1. ground conditions
2. overhead electrical wires
3. obstructions
4. variation in surface elevation
5. tie-back locations and methods
6. potential wind-loading conditions

#### *Loads and Requirements*

Before installing a platform, always consider the intended load. To reduce the impact of point loading, all workers, including those erecting the scaffolding, should always try to distribute loads uniformly on the scaffold.

Double planking on decks may be needed where pallets of masonry materials must be supported. Such pallets should be placed over the frame supports whenever possible.

**IMPORTANT:** Regularly inspect the support planks for damage and/or deterioration.

#### *Housekeeping*

Since scaffold decks are usually narrow, tools and materials used should be organized. No debris or waste materials should be allowed to collect on the platform, since they create a trip hazard.

### Inspection

1. Inspection frequency:
  - a. Before every use
  - b. After a period of inactivity of two days or more
  - c. After severe weather
2. Issues to look for:
  - a. damage to frames
  - b. braces and other structural components
  - c. damage to hooks on manufactured platforms
  - d. splits, knots and dry rot in planks
  - e. scaffolding that has been in place for a long time

### Floor concrete grinders

To ensure safe operation of a floor concrete grinder, maintenance and inspection procedures must be followed.

1. Disconnect the grinder from the power source before doing any maintenance.
2. Always work on a flat and level surface.
3. Grease bearings after every 50 hours of use.
4. Do a visual inspection before each use. Make sure all fasteners are tight and secure, metal has no cracks, and electrical wiring is not damaged. Check bearings and make sure proper guards are in place and secure.
5. Inspect belts before each use, checking for their tension. In case of using new equipment, re-tension belts after the first few hours of use. Replace any damaged, stretched or excessively worn belts (Proper belt tension is essential in ensuring efficient transmission of the engine/motor power to the grinding disc.).
6. Before each use, check the grinding discs to ensure they are tight (they become loose with use).
7. Before each use, check Neoprene bushing; replace if worn out.

## Vehicle Maintenance

To ensure safe and efficient performance, all vehicles must be maintained and inspected regularly.

### Preventive Maintenance for Vehicles

<b>Title:</b>	Preventive Maintenance for Company Vehicles	<b>Date of Issue:</b>
<b>Approved by:</b>		<b>Review/Revise Date:</b>
<b>Location:</b>		
<ol style="list-style-type: none"><li>1. All company vehicles must be on the master preventive maintenance inventory list.</li><li>2. The vehicles will be maintained in accordance with the preventive maintenance program outlined in the owner's manual.</li><li>3. Preventive maintenance will be conducted every 6,000 kms.</li><li>4. The standards outlined in the manufacturer's preventive maintenance program will be followed. The maintenance chart in the booklet will be used for recording all maintenance.</li><li>5. All maintenance will be conducted at the local licensed mechanic shop.</li><li>6. It is the responsibility of management to review the company's preventive maintenance program on an annual basis, to ensure continuous improvements.</li><li>7. Recommendations that are discovered as a result of the annual review or throughout the year will be documented and submitted to management.</li><li>8. Management will follow up on the corrective actions on a pre-determined time frame (to be determined on a case by case basis) to ensure that the corrective actions have been completed.</li></ol>		
<b>Filing System</b> The maintenance department will establish a filing system to maintain the maintenance records.		
<b>Records</b> Maintenance Recording Form Maintenance Schedule Matrix		
<b>Approval signature:</b>	[signature]	
<b>Document to be posted?</b>	[Yes/No]	
<b>Distribution to:</b>	[distribution]	

### Maintenance Schedule Matrix

Vehicle license number	Year/Model	Next Service Date	Who does maintenance



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## Training and Communications

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Training and Communications

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act*, and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a policy on orientation, training and communication. Every employee at Joint Seal must undergo orientation and training as applicable to their duties.

### **Orientation**

There is an established orientation program for new employees which covers company rules and procedures, employee rights and duties, as well as health and safety concerns (see the corresponding section below) and has been standardized for company-wide use.

#### New Employee:

All new employees will be given orientation by their supervisor on company rules and procedures, employee rights and duties, as well as health and safety and other applicable policies. Each employee shall sign an acknowledgement at the end of the orientation session.

#### New Jobsite:

For every new jobsite, both new and existing employees will receive orientation on jobsite particulars before the work commences. Each employee shall sign an acknowledgement at the end of the orientation session.

### **Training**

To ensure the competency of each employee, they will be given training by their supervisor before starting a specific job type: crack repair, patching, caulking, and expansion joint injection. Site supervisor verifies each employee has been trained in the corresponding job types, before work on a new site begins.

Office employees, supervisors and management are trained on their respective duties. Upon completion, employees sign the acknowledgement of having received and understood the training. Employees are observed by supervisors to further ensure they are applying the training received.

Every worker must receive WHMIS and First Aid training; Working at Heights training will be provided to those whose work directly requires it.

### **New Employees**

All new employees of Joint Seal Waterproofing will read and review our Health and Safety Policy with their supervisor. Upon completion, the worker will sign the acknowledgement of acceptance and understanding of his/her obligations and responsibilities.

The supervisor will complete the *New Worker Orientation Checklist* with the employee before they start working on site. The completed checklist will be submitted to management to be kept on file at the head office.

**All Employees**

The supervisor will complete the *Supervisor Site Orientation Checklist* before starting each new job. Upon completion, a copy will remain on site, and the supervisor shall review the checklist items with all the employees that will be working on a given site.

**Sub-contractors**

Subcontractor orientation will require the completion of a Pre-Job Safety Analysis (PSA) for each trade prior to the start of work. Joint Seal supervisor will review and accept or modify the proposed PSA, as required. Sub-contractor supervisor will be trained on jobsite-specific particulars and will then review the information with their workers, with a copy of the final PSA signed off and kept on site.

At least once per year, management will review the orientation policy and procedures, training materials, and communication procedures.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Orientation Program

Orientation shall be given to each employee with pertinent information: both when they are new to the company and when they are to begin working at a new jobsite.

### New Employee

All new employees will be given orientation by their supervisor on company rules and procedures, employee rights and duties, as well as health and safety and other applicable policies. Each employee shall sign an acknowledgement at the end of the orientation session.

### New Jobsite

Each time work is to commence at a new jobsite, all employees involved – whether new or existing – will receive orientation on jobsite particulars. Each employee shall sign an acknowledgement at the end of the orientation session.

## Training

### On-site Workers

On-site workers will be trained by their supervisor before beginning each job type: crack repair, patching, caulking, and expansion joint injection. The supervisor shall explain and demonstrate how each type of work is done – step-by-step; he/she will then closely supervise the trainees as they attempt to carry out the same procedure.

Employees will go through a checklist for each job type and sign the acknowledgement of having been trained on each specific job type.

### Crack repair

To repair a cracked concrete surface, the following procedure is applied:

1. Cracks are opened to prep the area for repair:
  - a. Grinder – for small thin cracks.
  - b. Chipping gun – for large deep cracks.
  - c. Circular saw – for long cracks.
2. Adhesive is applied with a brush.
3. The crack is patched with the Polyforce Polymer Cement.
4. Waterproofing Polyforce Plus Primer is applied over the area.

### Patching

To patch a concrete surface, the following procedure is applied:

1. Delaminated concrete is removed with a chipping gun.
2. Adhesive is applied with a brush.
3. Patching is done:
  - a. Prepare the patching mix (for ceilings, use the patching mix and Cement All at 50:50. For walls and floors, use the patching mix and Cement All at 75:25.):



- i. First add some water in the container.
  - ii. Add the parging mix and the Cement All.
  - iii. Stir the mix with a trowel or a mixer.
  - iv. Continue adding water and mixing until you achieve a dough-like consistency.
- b. Apply the patch – patch thickness will depend on the depth, length and width of the area to be covered. For thin patches, polymer cement is used.

#### *Patching with polymer cement*

A mix of polymer cement and Cement All is used for patching in cold weather to prevent new concrete from cracking, and for thin patch applications, as both fast-drying materials. The proportion used to make the mix is Polymer cement and Cement All at 3:1.

Follow the same procedure as for making the patching mix.

4. Parging is done only when necessary (when the client requests that the patching be blended in with the rest of the concrete surfaces, as is often the case on balcony surfaces):
  - a. Prepare the parging mix (same procedure as the patching mix).
  - b. Apply the mix with a trowel.
  - c. Apply the finish with a polyethylene trowel.
5. Primer and paint (if needed/requested) is applied with a brush.

#### *Caulking*

Caulking is used to seal joints or seams against leakage in a variety of structures. One of the typical applications is caulking done around the window frames.

To apply new caulking, the following procedure is applied:

1. Remove old caulking with a snap-off retractable utility knife, scarping the surfaces adjacent to the seam.
2. Vacuum up the debris and the open joint/seam.
3. Set the width of the joint by putting tape around both edges, pressing down firmly along the edge of the tape to ensure a tight seal:
  - a. The width of the caulk joint will be controlled.
  - b. The surrounding surfaces will not be smeared.
4. Apply new caulking:
  - a. Apply the caulk at a 45-degree angle between horizontal and perpendicular.
  - b. Draw the tip of the caulk tube along the length of the joint while slowly squeezing the handle of the caulk gun. The speed should be slow yet consistent to ensure good end results.

5. Smooth the joint:
  - a. If smoothing the caulk with fingers, wet your finger and a corner of a cloth rag with alcohol. Otherwise, use a popsicle stick.
  - b. Smooth the caulk joint, working from one end to another, while applying steady pressure.
  - c. Remove excess caulk from finger with the dampened rag and re-wet your finger.
  - d. Continue smoothing the joint until finished.
6. Remove the tape. Do it slowly, pulling it away at an angle, not toward the joint.

### Expansion joint injection

To waterproof an expansion joint, the following steps are taken:

#### *Floor expansion joints*

1. Prepare the caulking gun:
  - a. Place the PolyFlex cartridge in the caulking gun.
  - b. Place the nozzle (that will mix the two components of PolyFlex).
2. Inject the material into the joint until the whole joint is filled.

#### *Wall expansion joints*

1. Put duct tape from wall level to the height of about two feet.
2. Prepare the caulking gun:
  - a. Place the PolyFlex cartridge in the caulking gun.
  - b. Place the nozzle (that will mix the two components of PolyFlex).
3. Inject the material into the joint until it reaches the end of the tape.
4. Place a new piece of tape over the next two feet, making sure it overlaps the previous piece by about two inches. Continue injecting and placing more tape until the entire joint is filled, all the way to the ceiling.

#### *Ceiling expansion joints*

1. The joint is cleaned.
2. Backer rod is inserted.
3. Liquid material is injected behind the backer rod.

NOTE: Special care must be taken – work must be done on a secure firm platform, a face shield must be used in addition to safety glasses, and workers must take regular breaks because this work is done in an unnatural position which causes tension.

## Ledge Beam Waterproofing

To waterproof a ledge beam, it is necessary to injection the expansion joint located on top of it.

The following procedure is applied:

1. Drill an injection port with a ½ inch concrete bit. Stop drilling when you reach the expansion joint:
  - a. If it is full of water, the liquid will come out.
  - b. Otherwise, you will feel a push and hear a difference in the drilling sound.
2. Cut out an 18-inch-long piece of polyethylene tubing (with a 3/8 inch inside diameter and ½ outside diameter) and paint 10 inches of it with Polyforce Adhesive.
3. Place this tubing inside the injection port, leaving about 8 inches of it hanging over.
4. Paint approximately 3 inches around the protruding tube with Polyforce Adhesive.
5. Reinforce the entry port with a Cement All and black cement mixture (in a half liter cup, add half a cup of Cement All and 1/8 of black cement, and add enough water for a dough-like consistency). Let it dry for about 20 minutes or use a propane torch for faster drying. Once the reinforcement is dry, the expansion joint is ready for injection.
6. Place a 3/8 inch copper coupling inside the protruding tube on one side and the injection pot tube on the other, to join the two.
7. Use clamps to ensure the coupling stays in place, firmly joining the two tubes.
8. Prepare the material for injection:
  - a. If using PolyFlex, take half a liter of each of the PolyFlex two components and place them into a round bucket. If using polyurethane, take the hardener and the base (1:10 proportion) and place them into a round bucket.
  - b. Mix the two components.
  - c. Insert the bucket into the injection pot.
9. Tighten the lid on the injection pot.
10. Connect the air hose to the injection pot and the compressor.
11. Turn on the compressor and the valve on the pot to start the injection.

## Office Workers

### Health and Safety

At least one office staff member must be trained in First Aid, Emergency Preparedness, WHMIS, Workplace Inspection, Personal Protective Equipment (PPE), and as a Health and Safety (H&S) Awareness Supervisor. All members of office staff must receive training in H&S Awareness and Violence in the Workplace.

## Supervisors

### Health and Safety

All supervisors must be trained in First Aid, Emergency Preparedness, WHMIS, Workplace Inspection, Personal Protective Equipment (PPE), Health and Safety (H&S) Awareness, Violence in the Workplace, Working at Heights, and Working in Confined Spaces.

## Managers

### Health and Safety

All managers must be trained in First Aid, Emergency Preparedness, WHMIS, Workplace Inspection, Personal Protective Equipment (PPE), Health and Safety (H&S) Awareness, Violence in the Workplace, Working at Heights, and Working in Confined Spaces.



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## Workplace Inspections

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Workplace Inspections Procedure

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a Workplace Inspection Procedure for our facilities: office, warehouse, and jobsites. The following tools, equipment and vehicles must be inspected before each use – inspection forms must be filled out, following the checklists (all the inspection forms and checklists are provided in the corresponding sections below):

Tools: chain saws, circular saws, power tools, propane torch, portable grinders, extension cords.

Equipment: generators, water pumps, injection pots, pressure washer, cement mixer, portable scaffolds, and floor concrete grinders.

Vehicles: 2016 Ford E450, 2012 Ford Transit, 2018 Ram ProMaster, and 2014 Nissan NV200.

### Responsibilities

Supervisors must carry out site, equipment, tool, and vehicle inspections regularly, in accordance with current legislation, with the purpose of identifying and recording hazards for corrective action (corrective action plan must be kept on file together with the inspections). All the findings are to be recorded and communicated to senior management: they will be kept in the corresponding binders for management to review. These binders will be in possession of the supervisors at all times, and will be available to workers for consultation, upon request.

Workers will also participate in inspections by checking their own equipment and tools before each use.

### Inspections

Each workplace (office, warehouse, and jobsites) must be inspected weekly. Circle check should be performed on company vehicles daily, while tools and equipment must be inspected before every use.

When the forms are filled out, they must be kept on file. All the inspection forms must be filled out completely, in accordance with the current legislation.

### Definition

Hazard – any source of potential damage, harm or adverse health effects on something or someone under certain conditions at work (Canadian Centre for Occupational Health and Safety, 2011).

Risk – chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard. It may also apply to situations with property or equipment loss (Canadian Centre for Occupational Health and Safety, 2011).

## **Guidelines**

Prior to conducting a Workplace Health and Safety Inspection, the following materials shall be gathered:

- Equipment inventory
- Manufacturer's safety manuals
- Technical safety data sheet
- Chemical inventory
- SDS
- WHMIS requirements
- Workplace Inspection Checklist
- Previous Inspection Reports
- Ensure recommendations were implemented

## **Workplace Hazards**

When conducting a workplace inspection, the inspector may encounter some, or all of the following hazards:

- Safety Hazards (i.e., inadequate machine guards, unsafe workplace conditions, unsafe work practices)
- Biological Hazards (i.e., viruses, bacteria, fungi, parasites)
- Chemical Hazards (i.e., liquid, vapours, fumes, dust, gas)
- Ergonomic Hazards (i.e., repetitive and forceful movements, temperature extremes, improperly designed workstations)
- Physical Hazards (i.e., noise, vibration, energy, water, electricity, radiation, pressure)

## **Workplace Inspection Principles**

The Canadian Centre for Occupational Health and Safety states that when a workplace inspection is being conducted, the following principles shall be adhered to (Canadian Centre for Occupational Health and Safety, 2011):

- Draw attention to the presence of any immediate danger -- other items can be outlined on the final report.
- Shut down and "lock out" any hazardous items that cannot be brought to a safe operating standard until repaired.
- Do NOT operate equipment – instead, ask the operator for a demonstration. If the operator of any piece of equipment does not know what dangers may be present, this is cause for concern. Never ignore any item because of the lack of knowledge to make an accurate judgement of safety. Find out the missing information.
- An inspection must be thorough: look up, down, around and inside.
- Clearly describe each hazard and its exact location in notes draft, making records immediately. In case the inspection is interrupted, record what has and has not been examined.

- Ask questions without disrupting work activities, unless absolutely necessary, as such interruptions may interfere with efficient assessment of the job function and may also create a potentially hazardous situation.
- Discuss with workers, "Can any problem, hazard or accident generate from this situation when looking at the equipment, the process or the environment?" Determine what corrections or controls are appropriate.
- Do not try to detect all hazards simply by relying on your senses or by looking at them during the inspection: equipment may have to be monitored to measure the levels of exposure to chemicals, noise, radiation or biological agents.
- If it not possible to clearly describe or sketch a particular situation, take a photograph.

**Final Inspection Report**

If there are any unfinished items on the previous report, record them onto the next report to ensure they are first on the list to be inspected (see a sample report form below).

**Safety for All**

Safety is everyone's responsibility, and regular inspections are one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:



## Workplace Inspection Report

A Workplace Inspection Report will contain the following information:

### Workplace Inspection Report

<b>Inspection Location:</b>				<b>Inspection Date:</b>		
<b>Department/ Area Inspected:</b>				<b>Inspection Time:</b>		
<b>Observations</b>				<b>For Future Follow-Up</b>		
Item & Location	Hazard(s) Observed	Repeat Item	Recommended Action	Responsible Person	Action Taken	Date
		Yes/No				

## Tool Inspection

### Chainsaws

Inspection Item: Chainsaw	Yes	No	N/A	Comments
Are all covers on the chainsaw in place and secured, and all screws and bolts tightened?				
Are all fluid reservoirs, caps, hoses or connections (such as for fuel, oil, and chain lube) properly seated and free of leaks?				
Is the muffler in place and free of damage or deterioration?				
Is the chain sharp, and free of damage?				
Is the chain set and maintained at the correct tension, per manufacturer's recommendations?				
Is there adequate chain lube in the reservoir?				
Is the tip guard in place on the saw (if equipped)?				
Is the chain brake functioning (if equipped)?				
Is the guide bar for the chain free of excessive wear, burrs, warpage, build-up of materials, or other damage?				
Do all switches (throttle lock, kill switch) function properly?				
Is the saw operator provided with and using all required personal protective equipment?				
Is there adequate space for the operator to maintain a stable stance and avoid falling material?				
Other observations:				
SIGNATURE:			DATE:	

### Circular Saws

Inspection Item: Circular Saws	Yes	No	N/A	Comments
Does the retracting lower blade guard work freely?				
Is the lower guard spring operating properly?				
Is the blade sharp enough?				
Is the blade rotating properly?				
Is the blade depth set properly (the lowest tooth not extending more than 0.3 cm (1/8") beneath the surface being cut)?				
Is the motor free from dust and chips?				
Other observations:				
SIGNATURE:			DATE:	

### Portable Grinders

Inspection Item	Yes	No	N/A	Comments
Is the outer case / body of the grinder free of cracks and breaks?				
Are all screws and fastenings on the outer case / body in place and tight?				
Is the power cord (including plug) free of breaks and/or other damage?				
Is the wheel guard securely installed and adjusted to a position that deflects sparks and debris from the abrasive wheel away from the grinder operator?				
Is the abrasive wheel in use suitable for the materials being ground (see label)?				
Is the abrasive wheel in use rated at the same (or greater) RPM's as the grinder (see label)?				
Is the abrasive wheel in use free of cracks, chips, other damage or deterioration?				
Was the abrasive wheel in use ring tested before mounting?				
Is the arbor opening (center hole) or bushing hole on the abrasive wheel in use the proper size for the grinder?				
Does the grinder run smoothly and properly when operated (free of unusual vibration/sounds/excessive heat)?				
Is the grinder operator provided with and using proper personal protective equipment?				
Other observations:				
SIGNATURE:				DATE:

### Chipping Guns

Inspection Item: Chipping Guns	Yes	No	N/A	Comments
Is the chord in good condition (not frayed)?				
Are the prongs bent or broken?				
Has the bit been lubricated?				
Has the handle been tightened?				
Other observations:				
SIGNATURE:			DATE:	

### Caulking Guns

Inspection Item: Injection Pot	Yes	No	N/A	Comments
Is the pot clean inside?				
Are the nuts and bolts clean?				
Can the nuts be tightened without effort?				
Is the conduit clean?				
Are the clamps in proper position?				
Other observations:				
SIGNATURE:			DATE:	

## Propane Torch

		Yes	No
<b>Trolley</b>	<b>Good condition</b>		
<b>Cylinders</b>			
Secured	Upright & chained		
Gas Type	Appropriate for task		
Labelling	Correctly labelled with name of gases		
Valves	Clean; uncontaminated; no PTFE		
<b>Regulators</b>			
Body Front & Pressure Adjustment Screw	Undamaged; Standard Marked BS EN ISO 2503		
	Labelled showing correct for gas in use; manufacturer's name visible		
	Inlet & outlet pressure appropriate		
	Fixed to body & operates freely		
Bullnose & Outlet Connection (N/A if regulator already fitted)	Undamaged; uncontaminated; unmodified; no PTFE		
	90° to body		
Pressure Relief Valve (where fitted)	In place; unmodified		
Gauges	In place; correct type		
	Undamaged; unmodified; no PTFE		
	Needles start at zero; positioned at correct side of stop; unbent		
	Backs in place		
<b>Flashback Arrestors</b>			
Body	Undamaged; standard marked ISO 5175; EN 730 -1		
Connections	Clean; uncontaminated; no PTFE		
Pressure Rating	Legible; suitable for cylinder		
Replacement Interval	Where date stamped under 5 years or manufacturer's recommendation		
Reset Button (if any)	Not tied down, restricted, modified or damaged		
<b>Hoses</b>			
Hose <i>Note: Taping together hoses may hide damage &amp; may present a fire hazard &amp; therefore not recommended by PGS</i>	Correct colour code		
	Standard marked ISO 3821 or EN 559		
	Undamaged		
	Appropriate connections		
	Uncoiled from cylinders when in use		
Fittings	Appropriate thread; clean; uncontaminated		
Non return/ Hose Check Valves	Fitted to each hose		
<b>Torch</b>			
Torch Valves	Operate freely to full extent & remain attached to torch; undamaged		

Inlet Filters & Connections	Clean; uncontaminated		
Handle	No excessive play		
Body	Undamaged; clean		
	No discolouration		
Pipework	Straight; undamaged		
Nozzle Seat	Undamaged; uncontaminated; no PTFE		
	Threads in good condition		
	Round in shape, not oval		
Nozzle & Nut	Correct type from nozzle data; undamaged; uncontaminated		
SIGNATURE:	DATE:		

## Equipment Inspection

### Generators

Inspection Item: Generator	Yes	No	Comments
Is the gas tank lid closed properly?			
Is the oil level sufficient?			
Is the hose in good condition?			
Are there any leaks?			
Are the outlets in good condition?			
SIGNATURE:			DATE:

### Water Pumps

Since the pump is completely sealed, visually inspect the condition of its cables: ensure they are not frayed or torn.

### Injection Pots

Inspection Item: Injection Pot	Yes	No	N/A	Comments
Is the pot clean inside?				
Are the nuts and bolts clean?				
Can the nuts be tightened without effort?				
Is the conduit clean?				
Are the clamps in proper position?				
Other observations:				
SIGNATURE:			DATE:	

### Portable Pressure Washers

Since the pressure washer is completely sealed, visually inspect the condition of its cable and hose: ensure they are not frayed or torn, and that the hose is not leaking.

### Cement Mixers

Inspection Item: Cement Mixer	Yes	No	Comments
Are any parts broken or missing?			
Is proper guarding in place?			
Is the electrical power cord in good condition?			
Is there a Ground Fault Circuit Interrupter protection for use outdoors?			
SIGNATURE:			DATE:

### Portable Scaffolds

Inspection Item: Portable Scaffolds	Yes	No	Comments
Are scaffold components, planking/decking in good condition? Planks graded for scaffold?			
Are all scaffold components in place and without defects?			
Are Mud Sills properly placed and adequately sized when required?			
Are screw jacks being used to level and plumb scaffold when required?			
Are base plates and/or screw jacks in firm contact with mudsills and frame?			
Is scaffold level and plumb?			
Are scaffold legs braced, with braces properly attached?			
Is guard railing in place on all open sides and ends?			
Are clamps secured in place?			
Is scaffold secured to structure to prevent movement?			
Are brackets, tube and clamp, and accessories properly placed with wedges tightened?			
Has the area around scaffold has been secured/roped off?			
Do planks have minimum 12" overlap and extend 6" beyond supports?			
Are toe boards properly installed when required?			
Is there proper access to get on and off the scaffold? Is a ladder secured in place?			
Has the scaffold control tag been signed and approved for use?			
If inspection reveals scaffold is unsafe to use, has "Do Not Use" tag been placed at all access points?			
SIGNATURE:			DATE:

### Floor Concrete Grinders

Inspection Item: Floor Concrete Grinders (General Requirements)	Yes	No	Comments
Do grinding wheels fit freely on the spindle?			
Is forcing the grinding wheel on the spindle prohibited?			
Are all wheels closely inspected and sound tested by the user (ring test) to make sure they have not been damaged before being mounted?			

<b>Note:</b> Good wheels should produce crisp ringing type sounds. If wheel has a dead thud type sound, then discard wheel.			
Is the RPM or SFM rating of the grinder compatible with the RPM OR SFM rating of the wheel? <b>Note:</b> RPM or SFM rating of the grinder should not exceed that of the wheel or blotter.			
Is the spindle nut properly tightened to hold the wheel in place? <b>Note:</b> Spindle nuts should only be hand tightened to prevent over-torquing of the nut which can result in wheel failure.			
Are all contact surfaces of the wheel, blotters, and flanges flat and free of foreign material?			
When a bushing is used in the wheel hole, is it positioned so it does not exceed the width of the wheel nor make contact with the flange?			
<b>Floor Grinders</b>			
Are all floor grinders equipped with functional spark guards and work rests?			
Does the clearance between the wheel and work rest exceed 1/8 of an inch?			
Does the safety guard cover the spindle end, nut, and flange projections?			
Are work rests provided that are rigidly supported and readily adjustable?			
Are work rests kept adjusted closely to the wheel with a maximum opening of 1/8 inch to prevent the work from being jammed between the wheel and the rest?			
<b>Portable and Other Abrasive Wheels</b>			
Do all machines with abrasive wheels greater than 2 inches in diameter have safety guards? Note: Some abrasive wheels may be equipped with flanges			
Is the maximum exposure angle on all grinding wheels 180 degrees or less?			
When in use, is the guard on right angle head or vertical portable grinders located between the operator and the wheel?			
Is the guard on right angle head or vertical portable grinders adjusted so that pieces of a broken wheel will be deflected away from the operator?			
Is the top half of the wheel on other grinders always enclosed?			
<b>Guards (General Requirements)</b>			
Are the guard and its fastenings strong enough to retain fragments of the wheel in case of breakage?			
Are guards mounted to maintain proper alignment with the wheel?			
Are tongue guards at the top of the floor stand grinders adjusted to the decreasing diameter of the wheel so that the gap is never more than ¼ of an inch?			
SIGNATURE:			DATE:

## Vehicle Inspection

Always perform a circle check before driving your vehicle.

### Circle Check

Start at the front (driver's side) and walk towards the back, checking all the following items. For any items answered as "No", indicate in the details section what the problem is and inform your supervisor immediately before using the vehicle.

Area	Condition	Yes	No	Details
Outside of the Vehicle	Are the windshield wipers in good condition?			
	Are all windows clean, clear, crack-free, and unobstructed?			
	Are mirrors secured to the vehicle and crack-free?			
Wheels and Tires	Are the wheel lugs and nuts tight?			
	Is the tire pressure correct for the tire and weather?			
	Is the tread wear within the acceptable level?			
	Are the tires free of punctures?			
Under the Hood	Are all the fluid levels at the appropriate level?			
	Is the wiring in good condition (e.g., no exposed wires, cracks, kinks, etc.)?			
	Are all the belts and hoses in good condition? No fluid leaking from the hoses?			
Inside the Vehicle	Does the parking brake hold against light acceleration?			
	Do the brakes hold and stop the vehicle smoothly?			
	Does the clutch and gearshift shift smoothly?			
	Does the steering wheel move smoothly?			
	Do headlights, warning lights, horn, turn signal all work?			
	Do the lights/gauges on the dash control panel work?			
	Are there any strange noises from any moving parts?			





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## Investigations and Reporting

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Investigations and Reporting Policy

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established an Investigations and Reporting Policy and Procedures. Any incident, accident or near miss must be reported and investigated immediately to determine its cause, and preventative/corrective action must be taken to prevent recurrences. Employees, supervisors, senior management, and the executive director each have their role in this process.

### **Types of incidents/accidents to be fully investigated:**

1. Accidents that result in injuries requiring medical aid,
2. Accidents that cause property damage or interrupt operation with potential loss,
3. Incidents that have the potential to result in (1) or (2) above, and
4. All incidents that, by regulation, must be reported to MOL, WSIB or other regulatory agencies.

### **Responsibilities**

1. All incidents/accidents, as well as near misses must be reported verbally by employees to their immediate supervisor.
2. Initial investigations shall be conducted by supervisors who are trained in investigation procedures. Corresponding reports shall be submitted promptly to management, using the Accident Investigation Form. They will be made available to all employees as well: they will be posted on the bulletin board and placed in the corresponding folder on each affected site.
3. Senior management shall determine the need for and, if necessary, carry out detailed investigations. They shall also determine causes and recommend corrective action. They will verify that all incident/accident reports and action plans, as well as inspection reports, are part of proactive reporting, prioritizing incidents and other input for an efficient preventative action process. Management will measure the effectiveness of preventative and corrective actions taken by verifying if there have been any recurrences of near misses, incidents or accidents.
4. Supervisors will ensure the preventative/corrective actions are implemented as soon as possible: they will check that they are in place and will sign the corresponding documentation. Such action plans will be posted on the bulletin board and placed in the corresponding folder on each effected site.

**Safety for All**

Because safety is everyone's responsibility, all incidents/accidents, as well as near misses, must be reported immediately. Due investigation must take place, and corrective action must be planned and implemented to prevent recurrence.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Accident/Incident Investigation Procedure

### Policy Statement

Joint Seal Waterproofing requires employees at all levels to get involved in and collaborate in accident/incident investigation.

Employees: Report to their supervisor all accidents and incidents that result in injury or property damage, as well as all near misses with the potential for serious injury or property damage.

Supervisors: Report the accident promptly to management to ensure timely submission to WSIB. Each accident will be analyzed to determine causes and contributing factors. The analysis will be used to reduce or eliminate the risk of recurrence.

Senior management and executive director: Ensure that any injured employee is attended to, damaged property is repaired or replaced, the accident is reported to WSIB in a timely manner, and the corrective action plan is implemented. They will also ensure that all the records are being kept on file.

### Definitions

An **Accident** is defined as an unplanned event that causes harm to people or damage to property. Accidents are categorized as one of the following:

- **Lost Time Injury (LTI)** refers to any injury that prevents a worker from coming to work on the day following the day of the injury.
- **Medical Aid** refers to any injury not severe enough to warrant more than the day of injury off, but where medical treatment by a doctor is given.
- **First Aid** refers only to injuries that can be treated on the job without any days lost.
- An **Incident** is defined as property damage but with no injury to workers.
- A **Near Miss** is a situation in which no injury or damage occurred but might have if conditions had been slightly different.
- **Occupational Illness** is defined as a condition resulting from a worker's exposure to chemical, biological or physical agents in the workplace to the extent that the health of the worker is impaired.
- **Critical Injury** is defined as an injury of a serious nature that:
  - a) Places life in jeopardy;
  - b) Produces unconsciousness;
  - c) Results in substantial loss of blood;
  - d) Involves the fracture of a leg or arm but not a finger or toe;
  - e) Involves the amputation of a leg, arm, hand or foot but not a finger or toe;
  - f) Consists of burns to a major portion of the body; or
  - g) Causes the loss of sight to an eye.

### Role of Supervisor in an Accident Investigation

The Supervisor and the Health and Safety Representative must investigate all accidents and incidents that involve workers. This includes completing the Accident Investigation Report, taking statements

from witnesses and collecting any other pertinent information and ensuring the injured worker has received the necessary medical assistance.

The supervisor is responsible for ensuring that all accident reports are transmitted to the Health and Safety Representative. If a worker, after receiving First Aid, later seeks further medical assistance, the supervisor must advise the Health and Safety Representative and have the treating practitioner complete a Functional Abilities Form.

If we are not the Constructor, report the accident to the Constructor through their Safety Coordinator or Project Manager.

The supervisor should contact the injured worker as frequently as the injury deems, or at least once a week.

**Procedure:**

1. The employee reports a work-related accident.
2. Administer first aid, as required.
3. Arrange for transportation for injured employee to medical treatment, if required.
4. Ensure Return to Work package accompanies worker.
5. Eliminate the hazard if possible, or guard the accident scene if worker is critically injured.
6. Investigate the cause of the accident and report findings in the Accident/Incident Report form by filling out *all* fields.
7. Keep a copy of the form on file.
8. Report all accidents/incidents as follows:
  - Lost Time Injuries
  - Medical Aid
  - First Aid
  - Incidents and Near Misses

Incident/Accident Investigation Form

Incident/Accident Investigation Form

Date of investigation		Investigator			
Date of injury		Injured worker			
Project location		Project Supervisor			
M.O.L. notified?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Joint H & S Committee in place?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Injured worker's address:					
Nature of injury reported (injured body part):					
Factors that led up to accident:					
Project Safety Representative:					
Comments:					
Names and addresses of witnesses and their comments (please use back for additional comments):					
Recommendations for corrective measures:					
Corrective measures taken?	N/A <input type="checkbox"/>	Yes <input type="checkbox"/>	To follow up on	(Date)	<input type="checkbox"/>

Investigator Signature

Executive Director

## Witness Statement Form

## Witness Statement Form

Date of injury/incident: \_\_\_\_\_ Injury/incident number: \_\_\_\_\_

Name of witness: \_\_\_\_\_

Date: \_\_\_\_\_

Name of interviewer:

### Details of interview:

[illegible]

Signature of witness:

Signature of interviewer:

## Accident Investigation Reviews

### Accident Investigation Report Reviews

Health & Safety Representative

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Senior Management

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Executive Director

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_



## Corrective Action Form

### Corrective Action Form

Date of injury/incident: \_\_\_\_\_ Injury/incident number: \_\_\_\_\_

Date: \_\_\_\_\_

Corrective action taken (as indicated on the Accident/Investigation Form):

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Recommendations:	
Date assigned:	
Responsibility assigned to:	
Details of what has to be done:	
Who has completed it?	
When was it completed?	





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## Emergency Preparedness

2021

3<sup>rd</sup> Edition

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## Emergency Preparedness

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established an Emergency Preparedness and Emergency Response Plan in order to ensure the safety of our employees at our office, warehouse, and on the jobsites.

Everyone must work together to provide and maintain a healthy and safe work environment that meets or exceeds all legislated requirements and industry standards. We strive to control or eliminate all reasonably foreseeable hazards that may result in an emergency.

We must all support our Emergency Response Plan to ensure that the necessary resources are made available in an emergency situation. This includes everyone within our scope: sub-contractors, clients, emergency services, and neighbors.

### **Responsibilities**

All managers are responsible and accountable for ensuring that emergency response procedures are followed at all times. Managers will ensure resources are made available for the successful implementation of all such procedures.

All supervisors are responsible and accountable for providing training on emergency response procedures, as well as ensuring their execution and enforcement within the locations under their direction. Supervisors will provide training to all employees on all the emergency preparedness and response procedures as outlined below in this document.

All employees are responsible and accountable for being familiar with the emergency response procedures and following them precisely should an emergency occur. Employees are expected to follow all emergency handling practices established by management.

All contractors, agency-supplied personnel and visitors will be expected to abide by all applicable emergency response procedures and established workplace rules.

### **Emergency Communication System**

In an emergency, there is a communication system in place, outlined in the Organization's Capabilities Assessment section.

### **Testing and Corrective Action**

Our Emergency Response Procedure and Plan must be tested on a regular basis to ensure its efficiency. Should any deficiencies be identified, corrective action must be taken to ensure their elimination.

### **Fire Extinguishers**

There is a total of four fire extinguishers on the premises: one at the reception, one at the office, and two in the warehouse, as well as one fire extinguisher per vehicle.

### **Transportation in an Emergency**

Depending on the severity of the injury, either 911 will be dialed, or the worker will be transported to the nearest health facility in one of the company vehicles.

**Safety – Everyone’s Responsibility**

Safety is everyone’s responsibility, and proper emergency preparedness and emergency response plan are some of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Types of Emergency

### *Natural Disasters*

- Natural disasters include the following: earthquakes, volcanic eruptions, hurricanes, severe thunderstorms and winter storms, floods.
- Technological emergencies include the following: power outages, fires, explosions, hazardous chemical releases.

### *Technological Emergencies*

- Technological emergencies include the following: power outages, fires, explosions, hazardous chemical releases.

### *Human Activity Emergencies*

- Human activity emergencies include the following: medical emergencies, motor vehicle accidents, workplace violence, bomb threats.

### *Off-site Emergencies*

- Off-site workplace emergencies may occur in any of the following scenarios:
  - While traveling by air, rail, or car
  - During field work
  - At a client's site
  - At a meeting or conference

## The Identification Process

### *On-site*

- Carry out site inspections.
- Review reports of past incidents that have affected own organization or similar ones.
- Ask every employee to identify as many potential emergencies as possible.
- Make a schedule of meetings and communicate it to all staff members.

### *Surrounding Areas*

- Identify potential emergencies at the following places:
  - nearby premises and adjacent buildings
  - nearby companies that deal with hazardous materials/processes
  - nearby services/utilities
  - natural features posing potential threats
  - disruptions posing a potential risk during an emergency



## Risk Assessment & Prioritization

### *Probability*

- Probability refers to the likelihood of an emergency occurring. It must be assessed for preventative purposes.

### *Consequences*

- Severity of the consequences must be assessed, with the term *severity* referring to the potential degree of loss.

### *Calculation*

- Both probability and consequences are assigned a numerical value, and then a risk rating is calculated. These results are then arranged in order of the risk they represent in order to prioritize emergency response.

# Organization's Capability Assessment

## *People*

- Before any emergency event, it is vital to identify individuals who can provide the following:
  - technical expertise
  - knowledge of equipment operation
  - emergency action knowledge
  - medical aid
  - site security
  - communication and media relations
  - procurement of outside resources
  - continuation of business operations and customer service

- Any type of equipment and tools needed for a particular job must be safe to operate and come furnished with appropriate documentation. The necessary supplies must be made available in order to promote emergency prevention.
  
- Equipment includes:
  - Trucks and other vehicles
  - Material handling equipment (e.g. forklifts and dollies)
  - Bulldozers or other heavy equipment
  - Emergency power generators and fuel
  - Lifting and hoisting equipment
  - Firefighting equipment
  - Breathing apparatus and respirators
  - Defibrillators and first-aid equipment
  - Spill response equipment and waste containers
  
- Tools include:
  - Power tools (cordless, charged)
  - Ladders
  - Flashlights and other lights
  - Shovels and vacuums
  
- Supplies include:
  - First-aid kits
  - Batteries (various sizes)
  - Blankets
  - Tape (various types)
  - Writing pads and pencils
  - Rope and wire
  - Emergency food supplies
  - Work gloves (various types)
  - Weather-resistant clothing

### *Communication Systems*

- Both internal and external communication is of utter importance in an emergency.
- Any combination of the following networks and devices must be made available for proper emergency response:
  - public telephone networks
  - internal telephone systems
  - cell phones
  - public address (PA) systems
  - two-way radios
  - computer networks
  - bullhorns and portable devices

### *Documentation*

- The following documents must be made available:
  - site and building plans
  - safety information
  - emergency contact lists
  - samples of sign-in sheets and visitor logs

## Procedures

### *Training*

- Emergency Response training will be provided for all employees.
- 

### *Issue Resolution*

Items arising for management to address will be:

- Reported to management in writing.

## Functions

### *Prevention*

- Encourage communication amongst employees and management regarding emergency situations prevention.
  - Promote best practices in health and safety management, as well as emergency prevention.
  - Identify trends that will proactively address emerging health and safety issues.
  -
- 

### *Investigation of Critical Injuries or Fatalities*

Director must be advised immediately of critical injuries and fatalities. The worker members must designate one or more worker members to investigate these cases. The designated worker may inspect the place where the accident occurred and any machine, device, etc. and report his findings to the Health & Safety Representative, as well as a MOL director.






The Health & Safety Representative must:

- Ensure prescribed requirements of the [OHSA \(S. 51 & 52\)](#) and [Industrial Regulations \(S. 5 & 6\)](#) are carried out as required.
  - Review all incidents and investigate if deemed warranted by the management.
  - Review all incident/investigation reports.
- 

### *Workplace Refusal / Bilateral Work Stoppage*

Workers have a duty to participate in work refusal and work stoppage situations.

- In a work refusal, the Health & Safety Representative works with the worker who is refusing and the supervisors of that worker to try to come up with a solution that is safe.
- In a bilateral work stoppage situation, if two designated certified members – one management and one worker – decide a 'dangerous circumstance' exists, work can be stopped.

Emergency Procedures	
<p>1</p> 	<p><b>STAY CALM</b></p> <p>DO NOT PANIC. Your behaviour can influence others, so staying calm will help the emergency response.</p>
<p>2</p> 	<p><b>TAKE COMMAND</b></p> <p>Call—or delegate someone to call— emergency services (911) immediately and explain the situation. Assign someone to meet and direct the ambulance to the location.</p>
<p>3</p> 	<p><b>ASSESS THE SITUATION</b></p> <p>Use extreme caution when approaching the scene to avoid being injured yourself. Try to determine what happened and what the emergency is. Try to eliminate or control the cause of the emergency to prevent further danger to the injured worker, to others, or to the property. Give first aid as soon as possible.</p>
<p>4</p> 	<p><b>PROVIDE PROTECTION</b></p> <p>Safeguard the area to protect others from being injured and prevent further losses. You may be called upon to help divert traffic, suppress a fire, prevent objects from falling, or shut down equipment or utilities.</p>
<p>5</p> 	<p><b>PRESERVE THE SCENE</b></p> <p>Do not disturb anything except to save a life, relieve suffering, or prevent immediate or further losses. Barricade, rope off, or post a guard at the scene to make sure that nothing is moved until the authorities have completed their investigation.</p>

6



### **FOLLOW PROCEDURES**

Follow the procedures outlined in your company's emergency response plan. Ensure that senior management is informed. They can contact the proper authorities, notify relatives, and begin the procedures for reporting and investigating the incident.

## Response to specific scenarios

### *Overview*









Depending on the nature of the emergency, different procedures are set in place.





- The appropriate response depends on the available internal and external resources (such as Fire Department).
- Small fires can be put out with portable fire extinguishers. The type of extinguisher to use depends on the type of fire; their use is shown on the following chart:

**Caution: Do not use a fire extinguisher unless you have received training in its proper use.**

CLASS OF FIRE	TYPE OF FIRE	APPROVED FIRE EXTINGUISHER
 ORDINARY 	Wood, paper, cloth	Type A; Type A-B
 FLAMMABLE 	Gasoline, paints, oils, grease	Type A-B; Type B-C; Type A-B-C
 ELECTRICAL 	Electrical, wiring, fuse box	Type B-C; Type A-B-C
 COMBUSTIBLES  METALS	Metals	Bucket of Sand

- Use a fire extinguisher only if ALL of the following apply:
  - the building is being evacuated and the fire alarm is activated
  - the fire department (911) is being called
  - the fire is small, contained and not spreading beyond its starting point
  - the exit is clear, so you can exit safely
  - you can avoid smoke inhalation
  - a proper extinguisher is readily available
  - you know how to use the extinguisher

**If any of these conditions do not apply, do NOT use the fire extinguisher. Call for help and leave the area immediately.**

**Fire response guidelines:**

When the alarm is activated, ensure the following:

- all employees follow evacuation procedures
- the supervisor initiates the response plan
- no team member will be exposed to unreasonable risk
- a buddy system is used if response team members remain at risk for any reason

- assessing the situation and meeting the fire department, rescue and first aid take priority over fire suppression
- the possibility of an explosion must always be avoided

- Environmental, safety, and health hazards due to spills of hazardous materials must be minimized.

**IMPORTANT: Only properly trained personnel should be allowed to clean up spills of hazardous chemicals. If trained personnel are not available, outside resources must be used.**

▪ **Small spills:**

- EVACUATE the area.
- REPORT the spill to personnel trained in toxic spill clean-up procedures.
- ELIMINATE the source of the spill by closing valves, turning over leaking containers, etc.
- PREVENT the spill from entering any sanitary or storm water drainage system.
- CLEAN up spill using equipment and principles addressed in training.
- CLEAN all equipment and floors.
- LABEL all waste and dispose of it properly.

▪ **Large spills:**

- EVACUATE employees to a safe area.
- PROVIDE first aid/medical help to exposed employees.
- BLOCK storm sewer(s).
- SHUT DOWN general ventilation systems if the spill occurs indoors.
- REPORT the spill to person(s) trained in spill management.
- CONTAIN the extent of the spill. Containment is always the first priority, unless there are injuries.
- IMPLEMENT spill control measures as established by your organization.

▪ **Safety measures in case of a spill:**

- COVER your mouth and nose with a damp cloth.
- TURN OFF heating, air conditioning and fans.
- STAY as far from the emergency site as possible.
- KEEP your body fully covered.
- PREPARE for possible evacuation.
- CLOSE all exterior and interior doors and windows.
- DO NOT EAT or DRINK anything uncovered.

▪ **Evacuation**

- If the spill is a threat to safety, evacuate the immediate area.
- If the spill is large and a threat to building occupants, order the evacuation of the building.
- If it is judged that a site safety hazard exists, consider declaring a full site evacuation of all non-essential personnel.

▪ **Notification**

- Notify all agencies, such as the Environment Authority, Labour Authority, Police, Medical Officer, etc. The authority involved depends on the specific circumstances of the emergency.

▪ **Transportation of dangerous goods reporting**

- Spills involving dangerous goods must be reported to the Police.

- In cases of serious injury or illness, prompt medical attention often makes the difference between life and death.

- **Procedures:**

- PROVIDE first aid.
- SECURE professional medical attention as quickly as possible.

- **First-aid person**

A first-aid person must:

- have current first-aid qualifications
- provide emergency assistance
- direct others to assist
- arrange transportation
- arrange medical intervention

- **Reports**

A team member should be assigned responsibility for the completion of appropriate reports, such as internal company reports, and reports required by the Compensation Board, Ministry of Labour, etc.

- **Critical injury or fatality**

- NOTIFY immediately:
  - senior management
  - regulatory authority
  - legal resources
- PRESERVE the accident scene and all evidence.
- ENSURE that you have adequate equipment and supplies required by health and safety regulations. These include:
  - first-aid supplies adequate to handle the potential event, not necessarily just what the law requires;
  - adequate number and location of deluge showers; and
  - adequate number and location of eyewash fountains.

## *Responding to Storms*

- A state of readiness must be maintained to respond in case of a storm to ensure everyone's safety, as well as the security of the facility.
- The following are the Canadian Red Cross recommendations:
  - ASSEMBLE a disaster supplies kit
  - MAINTAIN a three-day supply of the following basic items:
    - water
    - battery-operated radio
    - food
    - batteries
    - manual can opener
    - first aid kit
    - flashlight
    - cell phone

## *Tornado / High Winds*

- If a tornado watch is issued by the weather service:
  - ASSIGN personnel from the Emergency Response Team to monitor the weather and report on threatening conditions according to the established procedures.
  - REMOVE or SECURE loose materials and articles from the area if possible.
  - If a tornado warning is issued by the weather service:
  - SEEK shelter/safety in the following areas:
    - a basement, underground excavation, or lower floor of interior hallway or corridor (preferably a steel-framed or reinforced concrete building)
    - if no basement is available, seek shelter under a sturdy workbench or heavy furniture (i.e., table or desk)
    - in open country, move away from the tornado path at a right angle
    - if there is no time to escape, lie flat in the nearest depression (i.e., ditch or ravine)
  - AVOID the following:
    - top floors of buildings
    - areas with glass windows or doors
    - auditoriums, gymnasiums, cafeterias or other areas with large, free-span roofs
    - automobiles
  - KEEP the following items with you:
    - flashlight;
    - radio; and
    - portable or cellular telephone.
- LISTEN for radio reports.

- Since such storms can be accompanied by violent winds, extremely cold weather, heavy snow, freezing rain, ice storms, white-outs, and electric power failures, follow these recommendations:
  - KEEP adequate supply of food in case it is not safe to go out or businesses are closed.
  - WATCH for severe weather warnings in your area.
  - REMAIN indoors during severe weather conditions.
  - DRESS warmly if you must go out.
  - KEEP a winter storm kit in your vehicle. Typical winter kit supplies include:
    - shovel
    - sand
    - tow-chain
    - flashlight
    - warning light or flares
    - extra clothing
    - warm blankets and footwear
    - emergency food
    - matches
    - maps
    - candle (in a deep can)
    - de-icing material for fuel line and windshield
  - DRIVE with caution and, if necessary, turn back or seek shelter.
  - REMAIN on main roads and keep enough gasoline in your gas tank for the trip.
- If you are stuck on the road, do the following:
  - STAY inside your vehicle.
  - AVOID overexertion and exposure to cold. Shoveling snow in bitter cold can kill you.
  - ALLOW some fresh air in the vehicle.
  - ENSURE that exhaust fumes do not enter the vehicle.
  - EXERCISE your limbs, hands and feet vigorously and do not fall asleep.
  - SIGNAL passing traffic for help.
- After the storm is over, do the following:
  - PROVIDE help to trapped workers only if you are trained to do so. Otherwise call for emergency help following your company guidelines.
  - STAY away from fallen, loose or dangling electrical wires. Report such conditions to the electric supply company.
  - AVOID going in areas where there are dangling tree limbs, building structures weakened by the storm, and weakened bridges.
  - DRIVE only when absolutely necessary. Keep the roads clear for emergency vehicles and rescue workers.





## *Floods / Torrential Rains*

- When a warning is issued, these steps must be followed:
  - DECIDE if closing operations is appropriate.
  - CHECK nearby storm drains to ensure they are clear of debris.
  - REMOVE all movable equipment and supplies to a second floor or other elevated areas.
  - CHECK outside areas for equipment and materials that could be damaged by floodwaters or heavy rain accumulation.
  - CHECK and SECURE storage tanks.
  - SEAL securely all hatches and manholes.
  - CLOSE all valves.
  - SECURE to wooden pallets materials that cannot be moved easily.
  - UNPLUG electrical equipment and appliances.
  - FILL jugs with clean water in case water supplies become contaminated.
  - PLACE sandbags in and around all outside doors and thresholds.
  - EVACUATE quickly when you are advised to do so. AVOID downed power lines.
  - LEAVE low lying areas immediately.
  - LEAVE the car and seek higher ground immediately if driving in a low-lying area or if your car stalls in rapidly rising water.
  - STAY away from storm drains and irrigation ditches.
  - DO NOT DRINK tap water.
  - DO NOT DRIVE through or around police/construction barricades.
  - DO NOT DRIVE through flood water.

## *Power Failure*

Power failure is common due to extreme weather. Should it happen, these recommendations must be followed:

- NEVER use a generator indoors or in a garage. Exhaust fumes contain carbon monoxide which can be deadly if inhaled.
- USE portable generators outdoors only, in a dry, ventilated area away from attached garages or air intakes to the building.
- PLUG individual appliances into the generator using heavy-duty outdoor-rated cords with a wire gauge adequate for the appliance load.
- ENSURE the batteries in smoke alarms and carbon monoxide alarms are in good working condition.
- DO NOT USE wet electrical appliances.
- DO NOT TURN ON damaged electrical appliances.
- DO NOT PUT candles on or near anything that will burn. NEVER leave burning candles unattended.
- NEVER use charcoal indoors, because burning charcoal gives off carbon monoxide.

Sabotage can result in fires, spills, and equipment failure. To prevent such situations from occurring, these recommendations must be followed:

- All critical equipment should have:
  - restricted access
  - locked operating devices
  - tamper or intrusion alarms
- Access to your facility by vendors, contractors and other visitors, including employees from other sites, should be controlled. Responsibility for security, issuing of keys or pass cards, and others, must be assigned.
- Specific individuals should be given the responsibility to secure all doors, gates, etc., at the end of a shift. The names of those responsible should be posted.
- Facility access control should ensure that:
  - all visitors are logged in and out
  - visitors wear an ID badge
  - an authorized employee escorts visitors throughout the entire visit
  - contractors, vendors, truck drivers, etc., are to be restricted to work area only and must be supervised by an authorized employee
- Other important considerations:
  - Appropriate managers should be informed immediately of any employee termination.
  - All keys and pass cards must be returned on termination of employment.
  - All employees must report any suspected acts of sabotage to their supervisor.
  - Since the results of an act of sabotage can be the same as those resulting from accidental events, use appropriate response procedures.

## Emergency Response Plan Administration

### Document Review Process

All emergency response plans are reviewed on an annual basis, in accordance with regulatory requirements or as significant changes in regulation or key personnel requires.

Management is responsible for the plan(s) pertinent to their operations and must ensuring that any changes required are communicated to all parties. These changes will be included in the regular revision or as regulated.

The Corporate Emergency Response Plan will be reviewed by management, and approved by the Executive Director.

In addition to the annual review, changes may arise from training sessions, exercises, regulatory changes or requirements, after real incidents or as needed. Change requests will be analyzed and included in the upcoming revision when applicable or appropriate. If critical changes are required, a mid-year update may be issued.

Controlled copies of site-specific ERP are distributed together with the Corporate Emergency Response Plan. Documents will be distributed per the Distribution List in each site-specific ERP.

If applicable, the following revision table can be used to communicate any changes required of any Joint Seal Waterproofing's emergency response plans (corporate and site-specific) to all employees:

Table of Revisions		
Date	Revision Highlights	Requested By

## Emergency Response Planning Checklist

Company: <b>Joint Seal Waterproofing</b>	Date:
Completed by:	Site: <b>22 Jutland Rd, Unit C, Toronto, ON M8Z 2G9</b>
Program Administration: <b>Boris Gopka</b>	

	In Progress	Date Completed
Develop an Emergency Response Standard.	<input type="checkbox"/>	
Develop a Site Emergency Plan.	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify emergency access routes.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Indicate location of first aid stations/boxes and fire extinguishers.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure specialized PPE equipment is on site. (Indicate location.)</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure sufficient medical aid supplies are available on site (splints, stretchers, etc.) and indicate location.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Locate other firefighting equipment (standpipes, Siamese connections, and hydrants).</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Locate main power supply to the project.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify the location of emergency phones. (Post emergency list.)</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify nearest hospital or medical Centre.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify worker evacuation route(s) and assembly area(s).</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Locate garbage dumpsters and recycling bins.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Complete Hazard Identification and Risk Assessment Form.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Develop Emergency Response procedures for items identified in your hazard assessment.</li> </ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Include requirements for written notices. (What's required? When? Completed by whom? Who does it go to?) See legal obligations.</li> </ul>	<input type="checkbox"/>	



## Emergency Response Planning Checklist (continued)

	In Progress	Date Completed
<ul style="list-style-type: none"><li>• Designate a contact person to call necessary emergency services and MOL, MECC, etc.</li></ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"><li>• Make provisions for cordoning off the accident scene to protect workers.</li></ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"><li>• Ensure someone on the ER team documents where the injured worker has been taken (hospital, medical centre, etc.).</li></ul>	<input type="checkbox"/>	
<ul style="list-style-type: none"><li>• Set out method of communicating the plan.</li></ul>	<input type="checkbox"/>	

## Emergency Numbers

<b>Date:</b>	<b>Location:</b> 25 Coronet Rd., Unit 8, Toronto, ON
<b>Emergency NO.</b>	<b>911</b>
<b>Head Office:</b>	<b>(647) 479-4069</b>
<b>Site Supervisor:</b>	<b>Mike</b>
<b>Health &amp; Safety Representative:</b>	<b>Mike</b>
<b>Call Person Emergency Services:</b>	<b>Nataliya</b>
<b>First Aiders:</b>	
Rick Rawlinson	
Mike	
Ali	
Boris	
Valeriy	
Alex	
<b>Site Location:</b>	
<b>Other:</b>	
<b>General Contractor:</b>	
<b>Cell No:</b>	
<b>Sub-Contractor:</b>	
<b>Cell No:</b>	
<b>Sub-Contractor:</b>	
<b>Cell No:</b>	

## Emergency Preparedness Training

The following personnel have been trained to ensure a safe and orderly emergency evacuation of other employees:



**MUST HAVE RECORDS OF SUCH TRAININGS**

Facility			
Name	Title	Responsibility	Date



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## Statistics and Records

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Statistics and Records

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a procedure to organize, monitor and measure our Health and Safety performance through rigorous statistics and records keeping. Monthly and yearly injury and safety summaries are produced, as well as monthly and yearly statistical data reports to facilitate the analysis of our company's health and safety trends. Year-to-year comparisons must be carried out to help assess the efficiency of our Health and Safety Program and the improvements (if any) that have been suggested. These documents must be made available for consultation at the head office.

### **Analysis and Corrective Action Plans (CAPs)**

Annual statistics must be analyzed by senior management to identify any deficiencies of our Health and Safety Program, as well as needs or trends (e.g. need for more training, tools/equipment repair or replacement. Our management must also analyze first aid treatment records to identify trends and create corresponding CAPs. Every action plan will be communicated by means of memos to be posted on the company bullet board and through toolbox talks given by immediate supervisors.

A CAP will also be created once our company is audited by COR and if areas of improvement are identified.

Safety is everyone's responsibility, and regular inspections are one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Records Review and Statistical Analysis

### Guidelines

To assess the effectiveness of our Health & Safety Program, we review reports, records and summaries. Analysis of these documents will help us to create and implement a corrective action plan, if needed, in order to continue preventing accidents and injuries.

In addition to Hazard Assessment, Analysis and Control procedures already in place, it is Joint Seal's policy to carry out annual reviews of the following performance measures:

- Hazard reports<sup>1</sup>
- Accident investigations
- Lost time injury<sup>2</sup> reports
- Health & Safety Representative's report

To facilitate the review of data from these sources, there is an established system to document, maintain and keep records on all injuries, accidents, and incidents that occur on all projects.

### Roles and Responsibilities

Worker: Each worker is responsible for reporting all accidents, incidents, first aid occurrences, lost time injuries and equipment damage to their immediate supervisor.

Supervisor: Each supervisor is responsible for the following:

- Recording all accidents, incidents, first aid occurrences, lost time injuries, equipment damage, and MOL reports.
- Keep record of all relevant health and safety information at the office.
- Coordinate first aid response, accident investigation or other follow-up procedures after an accident.

Senior Management: Members of Senior management are responsible for the following:

1. Maintaining records of orientation, project inspections, safety audits, MOL reports and follow-up actions.
2. Monitor injury frequency rates.
3. Compile an annual report on all health and safety activities and occurrences on a project.
4. Ensure follow-up is performed for all action items.
5. Ensure appropriate actions are taken following review of quarterly project safety data report.

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<sup>1</sup> Refers to any hazard assessment performed by an outside resource.

<sup>2</sup> Refers to an injury where the direct result keeps an employee off work for more than one full day.

### **Records Review and Statistical Analysis Procedures**

1. All project safety data is registered and recorded at each jobsite, with appropriate responses initiated immediately (accident investigation, etc.)
2. All project safety data is made available to management. It will be used for statistical analysis in monthly and yearly reports.
3. All other project safety data is presented and reviewed using charts and graphs in annual reports that assess the following:

<b>Project Safety Data</b>	<b>Statistical Focus Examples</b>
Project inspections	Number performed, issue involved, hazards identified
Accident investigations	Number performed, recommendations, by occupation
Lost Time injuries	Frequency, injury type, body part involved, by occupation
Health & Safety Representative	Issues identified and follow-up

4. Appropriate action is taken by senior management and supervisors, in response to trends, first-time and repeated injuries, as well as commonly identified hazards.

### **Applicable Legislation**

Occupational Health and Safety Act, Sections 25-28.

## Health and Safety Trends

<b>Title:</b>		<b>Date of Issue:</b>	
<b>Approved by:</b>		<b>Review/Revise Date:</b>	
<b>Location:</b>			
<p>Senior Management will review Joint Seal's health and safety trends on an annual basis, to understand the patterns and take corrective action, if necessary.</p> <p>The Health and Safety Representative will prepare the trends review.</p> <p>The following documentation will be reviewed when developing the Safety Trends Review:</p> <ul style="list-style-type: none"> <li>▪ Injury/illness causes</li> <li>▪ Workplace inspections</li> <li>▪ Injury/Incident investigations</li> <li>▪ Hazard Reports</li> <li>▪ Work Refusal reports</li> <li>▪ Health and Safety recommendations from the Health and Safety Representative</li> <li>▪ WSIB injury/illness summary</li> </ul> <p>The Health and Safety Representative will create the summary of all injuries and near misses, and review patterns of occurrence. The report will take into consideration the following patterns: by shift; by injury type; by time of day; and by type of equipment.</p> <p>Suggested categories for the Trends Review are:</p> <ul style="list-style-type: none"> <li>▪ the number of work accident fatalities,</li> <li>▪ the number of lost workdays,</li> <li>▪ the number of non-fatal cases that required medical aid without lost workdays,</li> <li>▪ the incidence of occupational illnesses,</li> </ul> <p><b>Reminder:</b> When conducting your annual review, you must review hazard reports and health and safety trends. Consider requesting an OHS section 12 report from the WSIB. If a section 12 report is received, it must be posted for all employees to see. Another option could be to chart the trends on a graph.</p>			
<b>Approval Signature:</b>		<b>Document to be posted:</b> Yes – Annual trends report will be posted on the Health & Safety board for 14 days after review.	
<b>Distribution to:</b>			

### Trends Review Process

The annual review will be completed using the following process:

1. Health and Safety Representative will collect the data required to develop the Trends report.
2. Health and Safety Representative will review the data and develop the Trends report for management review.
3. Submit the Trends reports to management by January 31<sup>st</sup> of each year.
4. Management will review the Trends report at the February management meeting and make reply in writing to the Health and Safety Representative regarding any corrective action to be taken.
5. Health and Safety Representative will monitor the completion of the corrective action.

### Report contents:

- table of contents
- summary
- recommendations for management review
- tables representing the data

### Records

All Trends Reports will be kept on file at the office.

## Trends Review (Hazards)

**Year reviewed:**

**Data reviewed (from – to):**

- Injury/illness causes
- Workplace inspections
- Injury/incident investigations
- Hazard reports
- Work refusal reports
- Health and safety recommendations from the Health and Safety Representative
- WSIB injury/illness summary

### Results of review

In \_\_\_\_\_ [Year] the areas that have had the largest occurrences of injuries and near misses are, in order of highest to lowest:

1. Area 1 \_\_\_\_\_

- a. Issue 1 \_\_\_\_\_
- b. Issue 2 \_\_\_\_\_
- c. Issue 3 \_\_\_\_\_

2. Area 2 \_\_\_\_\_

- a. Issue 1 \_\_\_\_\_
- b. Issue 2 \_\_\_\_\_
- c. Issue 3 \_\_\_\_\_

3. Area 3 \_\_\_\_\_

- a. Issue 1 \_\_\_\_\_
- b. Issue 2 \_\_\_\_\_
- c. Issue 3 \_\_\_\_\_

Health and Safety Trends for the last 3 years, including types of injuries, are found on the next page.



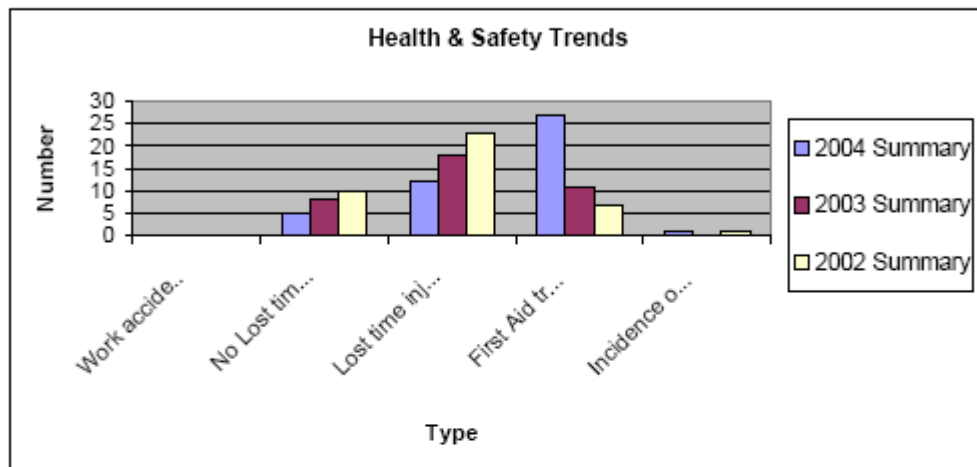
## Trends Review (Injuries)

A similar report may be produced, if required by senior management.

### SAMPLE – Trends Review (Injuries)

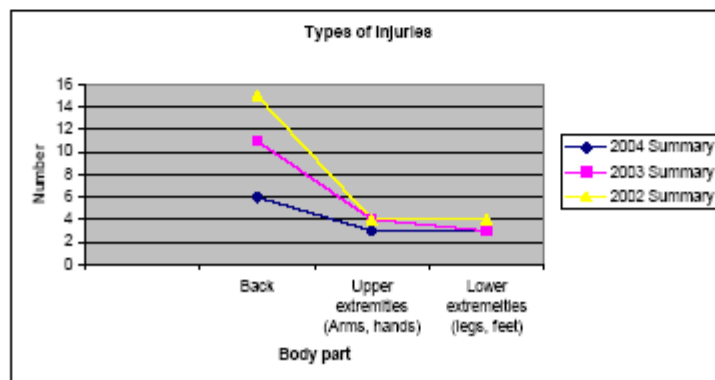
#### Health and Safety Trends

Number of	2004 Summary	2003 Summary	2002 Summary
Work accident fatalities	0	0	0
No Lost time injuries(NLTI)	5	8	10
Lost time injuries (LTI)	12	18	23
First Aid treatment only	27	11	7
Incidence of Occupational illnesses	1	0	1



#### Type of Injuries(for LTI only)

	2004 Summary	2003 Summary	2002 Summary
Back	6	11	15
Upper extremities (Arms, hands)	3	4	4
Lower extremities (legs, feet)	3	3	4



### Monthly and Yearly Formats

All the formats are available separately in the corresponding folder under JSW Statistics and Records.



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# Legislation

2021

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Legislation

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act (OHSA)*, the *Ontario Regulation 213/91* (Construction Regulation), and *Regulation 1101* (First Aid Requirements) and all associated regulations and agreements.

Applicable regulation is considered during our work planning process to ensure that all the work is carried out in a safe manner, and that our workers are competent and protected at all times. To make sure everyone is well-informed about the pertaining legislation, copies of the Act, the Construction Regulation, and the First Aid Requirements are available both at the office and in each company vehicle.

Our supervisors have attended the Basic of Supervising course and are fully aware of their rights and responsibilities, as outlined in the OHSA. They have trained the workers on their rights and responsibilities. To ensure that everyone is aware of the pertaining legislation and how we can all contribute to having a safe and healthy work environment at the office, at the warehouse, and on jobsites, the relevant posters are displayed on the company bulletin board, and the same information is available in the supervisor's binder in each company vehicle.

## Duties

### Employer

An employer has a range of legal duties, including the duty to ensure that equipment, materials, and protective devices as prescribed, are provided, are maintained in good condition, that prescribed measures and procedures are carried out in the workplace [subsection 25(1)], and the obligation to:

- instruct, inform and supervise workers to protect their health and safety [clause 25(2)(a)]
- assist in a medical emergency by providing any information, including confidential business information, to a qualified medical practitioner and other prescribed persons for the purpose of diagnosis or treatment [clause 25(2)(b)]
- appoint competent persons as supervisors [clause 25(2)(c)]. "Competent person" is a defined term under the OHSA as a person who:
  - is qualified because of knowledge, training and experience to organize the work and its performance,
  - is familiar with the Act and the regulations that apply to the work, and
  - has knowledge of any potential or actual danger to health or safety in the workplace
- inform a worker, or a person in authority over a worker, about any hazard in the work and train that worker in the handling, storage, use, disposal and transport of any equipment, substances, tools, material, etc. [clause 25(2)(d)]
- help joint health and safety committees (JHSCs) and health and safety representatives to carry out their functions [clause 25(2)(e)]
- not employ or permit persons under the prescribed age for the employer's workplace, to be in or near the workplace [clauses 25(2)(f) and (g)]

- take every precaution reasonable in the circumstances for the protection of a worker [clause 25(2)(h)]
- post a copy of the OHSA in the workplace, as well as explanatory material prepared by the Ministry of Labour, Training and Skills Development that outlines the rights, responsibilities and duties of workers in both English and in the majority language in the workplace [clause 25(2)(i)]
- in workplaces in which **more than five workers** are regularly employed, prepare a written occupational health and safety policy, review that policy at least once a year and set up and maintain a program to implement it [clause 25(2)(j)].
- post a copy of the occupational health and safety policy in the workplace, where workers will be most likely to see it [clause 25 (2)(k)]
- provide the JHSC or the health and safety representative with the results of any occupational health and safety report that the employer has. If the report is in writing, the employer must also provide a copy of the parts of the report that relate to occupational health and safety [clause 25(2)(l)]
- advise workers of the results of such a report. If the report is in writing, the employer must, on request, make available to workers copies of those portions that concern occupational health and safety [clause 25(2)(m)]
- notify a Director of the MLTSD if a JHSC (or a health and safety representative) has identified potential structural inadequacies of a building, structure, or any part thereof, or any other part of a workplace, whether temporary or permanent, as a source of danger or hazard to workers [clause 25(2)(n)] (Note: this clause does not apply to an employer that owns the workplace [section 25(5)])

Also note that a related duty under section 25(1) of the OHSA requires employers to ensure that every part of the physical structure of the workplace, whether it is temporary or permanent, complies with load requirements prescribed in the applicable Building Code provisions, any prescribed standards or sound engineering practice where Building Code provisions or prescribed standards do not apply [clause 25(1)(e)].

Employers may appoint themselves as supervisors if they meet all three qualifications of a competent person. [subsection 25(3)].

### Supervisor

A supervisor is a person appointed by the employer who has charge of a workplace or authority over a worker [subsection 1 (1)].

Workers are often asked to act as supervisors in the absence of persons hired in that capacity, particularly those identified by such terms as senior, charge, or lead hands. Despite the term used, it is very important to understand that if a worker or lead hand has been given "charge of a workplace or authority over a worker" this person has met the definition of a supervisor within the meaning of the OHSA and assumes the legal responsibilities of a supervisor under the Act.

The *Occupational Health and Safety Act* (OHSA) sets out certain specific duties for workplace supervisors. A supervisor must:

- ensure that a worker works in the manner and with the protective devices, measures and procedures required by the OHSA and the regulations [clause 27(1)(a)]
- ensure that any equipment, protective device or clothing required by the employer is used or worn by the worker [clause 27(1)(b)]
- advise a worker of any potential or actual health or safety dangers known by the supervisor [clause 27(2)(a)]
- if prescribed, provide a worker with written instructions about the measures and procedures to be taken for the worker's protection [clause 27(2)(b)], and
- take every precaution reasonable in the circumstances for the protection of workers [clause 27(2)(c)].

## Worker

Workers play a key role in health and safety at the workplace. Workers have various duties under the OHSA. Under the OHSA, a worker must:

- work in compliance with the Act and regulations [clause 28(1)(a)]
- use or wear any equipment, protective devices or clothing required by the employer [clause 28(1)(b)]
- report to the employer or supervisor any known missing or defective equipment or protective device that may endanger the worker or another worker [clause 28(1)(c)]
- report any hazard or contravention of the Act or regulations to the employer or supervisor [clause 28(1)(d)]
- not remove or make ineffective any protective device required by the employer or by the regulations other than in circumstances specified below [clause 28(2)(a)]. The only circumstance in which a worker may remove a protective device is where an adequate temporary protective device is provided in its place. Once there is no longer a need to remove the required protective device or to make it ineffective, it must be replaced immediately.
- not use or operate any equipment or work in a way that may endanger any worker [clause 28(2)(b)], and
- not engage in any prank, contest, feat of strength, unnecessary running or rough and boisterous conduct [clause 28(2)(c)]. Racing powered hand trucks in a warehouse or seeing who can pick up the most boxes are examples of unlawful conduct.

## Rights

All employees have a range of right, from being treated and compensated fairly at work to being trained on how to work safely. Their rights are protected by the Employment Standards Act (ESA), the Pay Equity Act (PEA), the Occupational Health and Safety Act (OHSA) and the Labour Relations Act (LRA).

### Rights under the ESA

#### 1. Getting paid

You should get a regular pay day and an accompanying wage statement (“pay stub”) that is clear. It’s a good idea to keep a record of the hours that you work. Most employees are entitled to be paid at least the regular minimum wage.

## 2. **Overtime**

Most employees must be paid [overtime pay](#) after 44 hours of work each week. The overtime rate must be at least 1½ times the regular rate of pay.

## 3. **Public holidays**

Ontario has nine public holidays every year.

- New Year's Day
- Good Friday
- Canada Day
- Thanksgiving Day
- Boxing Day (December 26)
- Family Day
- Victoria Day
- Labour Day
- Christmas Day

Most employees are entitled to take these days off work and be paid public holiday pay. Alternatively, they can agree in writing to work on the holiday and they will be paid:

- public holiday pay plus premium pay for the hours worked on the public holiday, or
- their regular rate for hours worked on the holiday, plus they will receive another day off (called a “substitute” holiday) with public holiday pay.

## 4. **Vacation time and pay**

Most employees earn at least two weeks of vacation after every 12 months. You are entitled to be paid at least four per cent of your total wages earned as [vacation pay](#). Any vacation pay not already paid is owed to you when your employment ends.

## 5. **Temporary help agency work**

[Temporary help agency employees](#) generally have the same rights as other employees under the ESA.

## 6. **Deductions from wages**

Only [three types of deductions](#) can be made from your wages: statutory (e.g., taxes), court-ordered and those authorized by you in writing.

Some employers require you to pay for your uniform. Deductions from your wages to pay for a uniform may be made only if you agree in writing to have a specified amount deducted. If a customer leaves without paying, or your error costs your employer money, that amount can't be deducted from your wages.

## 7. **Special rules**

Some jobs have special standards or exemptions. See our [Special Rule Tool](#) to learn more.

## 8. **The Employment Standards poster**

Your employer should have the [Employment Standards poster](#) displayed where you can read about some of your ESA rights.

## 9. When a job ends

In most cases, after working continuously for three months, you must receive advance notice in writing and/or termination pay if your employer ends your employment. The amount of notice and termination pay depends on how long you have been employed in the job.

### Rights under the Pay Equity Act

#### **The right to equal pay for work of equal value**

In Ontario, both men and women have the right to receive equal pay for doing work that may be very different in nature, but is of equal value. That right is protected by the Pay Equity Act (PEA).

The PEA requires employers to ensure employees in female job classes (jobs done mostly by women) are paid as much as workers in male job classes (jobs done mostly by men) when they are found to be comparable in value to the organization based on skill, effort, responsibility and working conditions.

The PEA covers male and female employees in female job classes of all public sector employers and of private sector employers with 10 or more employees in Ontario.

Employers are required to provide you with information about pay equity in your workplace. If you are represented by a union, your bargaining agent may be able to provide you with pay equity information.

Employers cannot fire or punish you for asking about pay equity or exercising your right to pay equity.

For more information or if you think that your employer has not achieved pay equity, please contact the Pay Equity Office at [pecinfo.pecinfo@ontario.ca](mailto:pecinfo.pecinfo@ontario.ca).

#### **The right to equal pay for equal work**

The Employment Standards Act also has provisions that ensure women and men receive equal pay for performing substantially the same job. That means work that requires the same skill, effort, responsibility, and is done under similar working conditions in the same establishment. Exceptions include: higher pay based on seniority, merit, a piecework system, etc.

### Rights under the LRA

Under Ontario's Labour relations Act, you have the right to join a trade union and participate in legal union activities.

It's against the law for an employer to fire you or discriminate against you for:

- joining a union
- your past association with a bargaining agent, and
- exercising any other rights under the LRA.

It's also against the law for a union or employer to intimidate or coerce you to join or not join a union.



## Rights under the OHSA

The Occupational Health and Safety Act (OHSA) sets out the rights and duties of workers, supervisors and employers in keeping workplaces safe and healthy in provincially regulated workplaces.

### *Your basics rights under the OHSA*

#### **The right to know**

You have the right to know about hazards in your workplace and to be trained how to protect yourself from harm. As of July 1, 2014, [the law](#) requires employers to make sure that all of their workers and supervisors have completed basic [health and safety awareness training](#). This training outlines workers', supervisors' and employers' rights, roles and responsibilities in keeping workplaces safe and healthy. This basic training for all workers and supervisors is in addition to other more detailed training required by law that depends on your workplace.

#### **The right to refuse**

You have the right to refuse unsafe work, including situations where you believe you're in danger of workplace violence. Your employer cannot fire or discipline you for refusing unsafe work or for asking them to address a health and safety issue. Your employer can't penalize you for following workplace health and safety laws and for obeying a Ministry of Labour inspector's order. This would be an unlawful reprisal.

Report hazards and any violations of workplace health and safety law right away to your supervisor or employer. If you can't get [health and safety](#) problems fixed at work, call the Ministry of Labour Health and Safety Contact Centre toll-free at 1-877-202-0008. You don't have to give your name. Services may be offered in various languages, in addition to English and French.

#### **The right to participate**

You also have the right to help identify and resolve workplace health and safety concerns. There are many ways you can do this, such as asking questions, raising concerns and giving positive feedback. One of the most effective ways you can get involved is to join the health and safety committee at your workplace.

Safety is everyone's responsibility, and abiding by the *Occupational Health and Safety Act*, the *Ontario Regulation 213/91*, and *Regulation 1101*, and any other applicable legislation is one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:



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# Occupational Health

2021

3<sup>rd</sup> Edition

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## Occupational Health

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established an Occupational Health Policy and a series of procedures to ensure we provide a health and safe workspace for all our employees. When Hazard Assessment, Analysis and Controls Procedure is carried out, occupational health hazards are also assessed. In case any such hazards are identified, a series of controls must be developed and implemented to address them, including any of the following: elimination, substitution, engineering controls, administrative controls (signage/warnings), and use of Personal Protective Equipment (PPE).

### Procedures

There are specific procedures (available below) to address safe work with the following: chemicals including the procedure on cleaning up chemical spills), physical agents, biological agents, and silica. Joint Seal Waterproofing has also established procedures on the proper handling and storage of hazardous materials, as well as entering confined spaces. All the personnel must be trained on each applicable procedure.

### Safety of Work Areas

To maintain the health and safety of our employees, toilets and eye-wash stations are cleaned and maintained on a regular basis, with all the necessary supplies provided. There is always an adequate amount of drinking water: there is a jar with filtered water at the office, as well as an ample supply of bottle water both in the warehouse and on jobsites.

Material Safety Data Sheets (MMSDs) are available in the warehouse where materials are stored, and on jobsites. All hazardous material must be properly labelled at all times. Should any worker notice a missing label, he or she must immediately report it to their immediate supervisor to ensure the proper label is placed as soon as possible (meanwhile, a temporary label stating "Do NOT use until labelled" must be placed on the material in question).

Safety is everyone's responsibility, and understanding our Occupational Health and Safety Policy and following all the safety procedures are one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Occupational Health & Safety Procedures: Chemicals

### Chemicals and Their Effects

<https://www.ccohs.ca/oshanswers/chemicals/poisonou.html>

Everything in the physical world is made of chemicals and some have poisonous effects (whether natural or man-made chemicals). Several factors can make a chemical poisonous:

- Route of entry into the body
- Amount or dose entering the body
- Toxicity of the chemical
- Removal from the body
- Biological variation

### *Chemical Toxicity*

#### **Routes of entry**

No chemical will be poisonous, though, until it comes with contact with the body, which is possible in several ways:

- Inhalation (breathing in) of contaminated air – the most common way that workplace products enter the body.
- Skin contact – chemicals can seep through the skin.
- Swallowing – can occur through contaminated food or cigarettes.
- Entry through the eyes – the least common.

#### **Amount or dose**

The amount or dose of chemical entering the body is the most important determining factors in its level of toxicity. In general, when a worker comes into contact with too much of a given chemical, it will have adverse effects on their health. What that amount is depends on the chemical.

Toxicity is a measure of the poisoning strength of a chemical. While, chemicals with low toxicity require large doses or amounts to cause poisoning, chemicals with high toxicity only need small doses to cause poisoning.

#### **Removal from the body**

While some workplace chemicals which enter the body are excreted from the body unchanged, others are broken down. The breakdown products may be more or less harmful than the original chemical. Eventually most chemicals and their breakdown products are removed as waste in the feces, urine, sweat or exhaled breath.

Some chemicals are stored temporarily in body organs and are removed over a short period of time. A few chemicals, such as graphite or silica dusts, can be inhaled into the lungs where they lodge for many years and may never be completely removed.

As a general rule there is less risk if the body can do one or both of the following:

- break down the chemical into less harmful chemicals
- rapidly remove the chemical from the body

## Biological variation

The toxic effect of the same chemical depends on the characteristics of the person affected: their age, sex, as well as individual susceptibility.

## Types of exposure

### 1. Sudden or short-term

A one-time exposure to relatively large amounts of the chemical can cause harm. Such exposure may happen in the following ways:

- through improper handling of the chemical
- when there is a spill or a leak from a valve or pipe carrying chemicals
- during maintenance or cleaning of equipment that normally contains chemicals (a solvent vat)

The harmful effects caused by one-time, sudden, high exposures are often called *acute toxicity effects*. Here are some examples:

- Serious burns of the mouth and the airways leading to the lungs may be caused by inhalation of high concentrations of acid vapours.
- Dizziness and nausea may be caused by skin contact with certain organic solvents that are absorbed through the skin.
- Irritation of the respiratory tract, dryness in the throat, and coughing can be caused by the inhalation of dusts.

### 2. Repeated over a long period of time

This kind of poisoning occurs because the exposure is repeated day after day over many years, but the exposure levels may be too small to cause acute toxicity. Harmful effects of repeated exposure are sometimes called *chronic toxicity effects*. Here are some examples:

- Extensive tooth decay due to loss of tooth enamel may occur because of the inhalation of certain acid vapours at concentrations over long periods of time.
- Nerve tissue may be damaged due to inhalation and skin absorption of some organic solvents over long periods of time.
- Severe and permanent lung damage can occur as scar tissue builds up in the lungs due to repeated exposure to dusts containing quartz.

## Toxicity vs hazard

Even a high toxicity chemical can have a low risk to health if it is used with proper precautions. On the other hand, it is possible that a chemical of low toxicity may present a high risk to health if it is used inappropriately or incorrectly.

Toxicity is a measure of the poisoning strength and is an *unchanging* characteristic of a chemical. Risk, on the other hand, is a *variable* feature. Risk is defined as the combination of the likelihood of the occurrence of a harm and the severity of that harm.

While the toxicity (hazard) of a chemical cannot be changed, the risk it presents can be controlled and minimized.

Potential hazards of materials containing carbon monoxide, gasoline, propane, silica  
[https://www.ccohs.ca/oshanswers/chemicals/chem\\_profiles/](https://www.ccohs.ca/oshanswers/chemicals/chem_profiles/)

### Carbon Monoxide

#### Identifying information

**CAS Registry No.:** 630-08-0

**Other Names:** CO

**Main Uses:** Manufacture of other chemicals, metallurgy, calibration gas.

**Appearance:** Colourless gas.

**Odour:** Odourless

**Canadian TDG:** UN1016

#### WHMIS 1998 Classification

A - Compressed Gas; B1 - Flammable Gas; D1A - Very Toxic; D2A - Very Toxic  
(Teratogenicity/embryotoxicity)



Class A



Class B1



Class D1A



Class D2A

#### Emergency Overview

Carbon monoxide is a colourless, odourless, EXTREMELY FLAMMABLE GAS. Distant ignition and flashback are possible. It is a COMPRESSED GAS. It contains gas under pressure. It may explode if heated. It is VERY TOXIC and is fatal if inhaled. It causes damage to blood. TERATOGEN/EMBRYOTOXIN. It may damage the unborn child. It may cause frostbite.

#### Potential Health Effects

Main route of exposure is through inhalation, although others are possible.

- **Inhalation:** VERY TOXIC. Can harm the blood (decreased ability to carry oxygen). Symptoms may include headache, nausea, dizziness, drowsiness and confusion. May cause permanent damage to organs including the brain and heart.
- **Skin Contact:** Not irritating. Direct contact with the liquefied gas can chill or freeze the skin (frostbite). Symptoms of mild frostbite include numbness, prickling and itching. Symptoms of more severe frostbite include a burning sensation and stiffness. The skin may become waxy white or yellow. Blistering, tissue death and infection may develop in severe cases.
- **Eye Contact:** Not irritating. Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.
- **Ingestion:** Not a relevant route of exposure (gas).
- **Effects of Long-Term (Chronic) Exposure:** Conclusions cannot be drawn from the limited studies available. May harm the nervous system. May harm the heart.
- **Carcinogenicity:** Not a carcinogen.
- **Teratogenicity / Embryotoxicity:** DEVELOPMENTAL HAZARD. May harm the unborn child. Has been associated with low birth weight or size, learning disabilities, miscarriage.



- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Not known to be a mutagen. Conclusions cannot be drawn from the limited studies available.

#### First Aid Measures

##### **Inhalation:**

**IMPORTANT:** Take precautions to prevent a fire by removing sources of ignition. Take precautions to ensure your own safety before attempting rescue – wear appropriate PPE.

Move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. If the heart has stopped, trained personnel should start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Skin Contact:** Not applicable (gas). Liquefied gas: quickly remove victim from source of contamination. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply direct heat. Gently remove clothing or jewelry that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove the rest of the garment. Loosely cover the affected area with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Eye Contact:** Not applicable (gas). Liquefied gas: immediately and briefly flush with lukewarm, gently flowing water. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Ingestion:** Not applicable (gas).

**First Aid Comments:** Some of the first aid procedures recommended here require advanced first aid training. All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

#### Fire Hazards and Extinguishing Media

**Flammable Properties:** EXTREMELY FLAMMABLE GAS. Can easily ignite. Can readily form explosive mixture with air at room temperature.

**Suitable Extinguishing Media:** Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

**Specific Hazards Arising from the Chemical:** Gas or vapour may accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a health hazard. Heat from fire can cause a rapid build-up of pressure inside cylinders. Explosive rupture and a sudden release of large amounts of gas may result. Cylinder may rocket. In a fire, the following hazardous materials may be generated: Very toxic carbon monoxide, carbon dioxide.

## Stability and Reactivity Hazards

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** Open flames, sparks, static discharge, heat and other ignition sources.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with: oxidizing agents (e.g. peroxides), halogens (e.g. chlorine), metals (e.g. aluminum). Not corrosive to: aluminum alloys, stainless steel.
- **Hazardous Decomposition Products:** None known.
- **Possibility of Hazardous Reactions:** None known.

## Exposure Limit

TLV® - TWA: 25 ppm BEI

TLV® = Threshold Limit Value. TWA = Time-Weighted Average. BEI® = Biological Exposure Index.

## Engineering Controls

If general ventilation is not adequate to control amount in the air, use local exhaust ventilation. Exhaust directly to the outside, taking any necessary precautions for environmental protection. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

## PPE Required

When working with carbon monoxide, the following personal protective equipment is required:

**Eye/Face Protection:** Not required but it is good practice to wear safety glasses or chemical safety goggles.

**Skin Protection:** If there is a risk of contacting liquid CO: wear chemical protective clothing e.g. gloves, aprons, boots. Suitable materials include: Butyl rubber, Viton®, Viton®/Butyl rubber.

## Respiratory Protection:

Up to 350 ppm:

(APF = 10) Any supplied-air respirator.

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the NIOSH Pocket Guide to Chemical Hazards for more information.

## Gasoline

### Identifying Information

**CAS Registry No.:** 8006-61-9

**Other Names:** Automotive gasoline, Petrol, Unleaded gasoline

**Main Uses:** Fuel, industrial solvent

**Appearance:** Clear colourless - amber volatile liquid.

**Odour:** Gasoline-like

**Canadian TDG:** UN1203

### WHMIS 1988 Classification

B2 - Flammable Liquid; D2A - Very Toxic (Carcinogenicity)



Class B2



Class D2A

### Emergency Overview

Clear colourless - amber volatile liquid with an odour. HIGHLY FLAMMABLE LIQUID AND VAPOUR. Distant ignition and flashback are possible. Can accumulate static charge. Can float on water and spread fire. CONFINED SPACE HAZARD. Can accumulate in hazardous amounts in low-lying areas especially inside confined spaces. May cause drowsiness and dizziness. SUSPECT CANCER HAZARD. Suspected of causing cancer. ASPIRATION hazard. May be fatal if swallowed and enters airways.

### Potential Health Effects

Main routes of exposure include inhalation, skin and eye contact.

- **Inhalation:** Can irritate the nose and throat. Can harm the nervous system. Symptoms may include headache, nausea, dizziness, drowsiness and confusion. A severe exposure can cause unconsciousness.
- **Skin Contact:** May cause mild irritation. Repeated or prolonged exposure can irritate the skin. Not expected to be absorbed through the skin. Any skin contact will also involve significant inhalation exposure.
- **Eye Contact:** Not irritating.
- **Ingestion:** Can irritate the mouth, throat and stomach. Can cause effects as described for inhalation. Aspiration hazard. May be drawn into the lungs if swallowed or vomited, causing severe lung damage. Death can result.
- **Effects of Long-Term (Chronic) Exposure:** Can cause dry, red, cracked skin (dermatitis) following skin contact. Gasoline is a complex mixture containing as many as 250 separate hydrocarbons including several with well-established toxicity (e.g., benzene, toluene, xylenes, and n-hexane). However, there is little information available regarding the potential effects from long-term occupational exposure to gasoline itself. Most of the information available relates to neurotoxic effects from intentional long-term abuse or "sniffing" of gasoline. These extreme exposures are not relevant to occupational exposures. Effects on the blood, which have been seen in some studies, are most likely from the presence of benzene or lead in the gasoline.

- **Carcinogenicity:** Possible carcinogen. May cause cancer based on animal information. Has been associated with cancer of the blood or blood system, kidney cancer.
- **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Conclusions cannot be drawn from the limited studies available. Gasoline contains variable amounts of benzene, a known mutagen.

#### First Aid Measures

##### **Inhalation:**

**IMPORTANT:** Take precautions to prevent a fire by removing sources of ignition. Take precautions to ensure your own safety before attempting rescue by wearing appropriate protective equipment.

Move victim to fresh air. Call a Poison Centre or doctor if the victim feels unwell.

**Skin Contact:** Quickly take off contaminated clothing, shoes and leather goods (e.g., watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm, gently flowing water and non-abrasive soap for 5 minutes. Call a Poison Centre or doctor if the victim feels unwell. Thoroughly clean clothing, shoes and leather goods before reuse or dispose of safely.

**Eye Contact:** Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If irritation or pain persists, see a doctor.

**Ingestion:** Have victim rinse mouth with water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Immediately call a Poison Centre or doctor.

**First Aid Comments:** All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

#### Fire Hazards and Extinguishing Media

**Flammable Properties:** HIGHLY FLAMMABLE LIQUID. Can ignite at room temperature. Releases vapour that can form explosive mixture with air. Can be ignited by static discharge.

**Suitable Extinguishing Media:** Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

**Specific Hazards Arising from the Chemical:** Liquid can float on water and may travel to distant locations and/or spread fire. Liquid can accumulate static charge by flow, splashing or agitation. Vapour may travel a considerable distance to a source of ignition and flash back to a leak or open container. Vapour may accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a toxicity hazard. Closed containers may rupture violently when heated releasing contents. Thermal decomposition and combustion products are highly dependent on combustion conditions and the type of additives and impurities present. In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide; corrosive, oxidizing nitrogen oxides; very toxic polycyclic aromatic hydrocarbons; corrosive sulfur oxides; and other chemicals.

## Stability and Reactivity Hazards

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** Open flames, sparks, static discharge, heat and other ignition sources.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with: oxidizing agents (e.g. peroxides). Not corrosive to metals.
- **Hazardous Decomposition Products:** None known.
- **Possibility of Hazardous Reactions:** None known.

## Accidental Release Measures

**Personal Precautions:** Eliminate all ignition sources. Use grounded, explosion-proof equipment. Use personal protective equipment as required.

**Methods for Containment and Clean-up:** Stop or reduce leak if safe to do so. Small spills or leaks: contain and soak up spill with absorbent that does not react with spilled product. Do NOT use combustible materials such as sawdust. Flush spill area. Large spills or leaks: contact emergency services and manufacturer/supplier for advice.

## Handling and Storage Practices to Follow

**Handling:** Immediately report leaks, spills or failures of the safety equipment (e.g., ventilation system). Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Do not use near welding operations or other high energy sources. Electrically bond and ground equipment. Ground clips must contact bare metal. Prevent accidental contact with incompatible chemicals.

**Storage:** Store in an area that is: cool, dry, well-ventilated, out of direct sunlight and away from heat and ignition sources, secure and separate from work areas. Electrically bond and ground containers. Ground clips must contact bare metal. Keep amount in storage to a minimum.

## Exposure Limit

ACGIH® TLV® - TWA: 300 ppm A3

ACGIH® TLV® - STEL [C]: 500 ppm A3

**Exposure Guideline Comments:** TLV® = Threshold Limit Value. TWA = Time-Weighted Average. STEL = Short-term Exposure Limit. C = Ceiling limit. A3 = Animal carcinogen.

## Engineering Controls

If general ventilation is not adequate to control amount in the air, use local exhaust ventilation. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Control static electricity discharges which includes bonding of equipment to ground.

## PPE Required

**Eye/Face Protection:** Not required but it is good practice to wear safety glasses or chemical safety goggles.

**Skin Protection:** Wear chemical protective clothing e.g. gloves, aprons, boots. Suitable materials include: nitrile rubber, Viton®, Tychem® BR/LV, Tychem® Responder® CSM, Tychem® TK. Recommendations are NOT valid for very thin nitrile rubber gloves (0.3 mm or less).

**Respiratory Protection:**

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode; or Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

The NIOSH Recommended Exposure Limit (REL) for gasoline has not been established.

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the NIOSH Pocket Guide to Chemical Hazards for more information.

NOTE: NIOSH has classified this substance as a potential occupational carcinogen, according to specific NIOSH criteria. This classification is reflected in these recommendations for respiratory protection, which specify that only the most reliable and protective respirators be worn at any detectable concentration. NIOSH has changed their policy on respiratory protection for possible carcinogens but not yet revised these recommendations for respiratory protection. The requirements in Canadian jurisdictions may vary.

## Propane

### Identifying Information

**CAS Registry No.:** 74-98-6

**Other names:** Dimethylmethane, n-Propane, Propyl hydride, Liquefied propane

**Main Uses:** Fuel, refrigerant, aerosol propellant, solvent.

**Appearance:** Colourless gas.

**Odour:** Odourless in its natural state; therefore, has POOR warning properties. An odourant such as mercaptan (rotten-egg smell) is used in most applications.

NOTE: Equipment containing propane may be contaminated with Naturally Occurring Radioactive Material (NORM) in the form of lead 210.

**Canadian TDG:** UN1978

### WHMIS 1988 Classification

A - Compressed Gas; B1 - Flammable Gas



Class A



Class B1

### Emergency Overview

Colourless gas. Odourless or an odourant is added. EXTREMELY FLAMMABLE GAS. Distant ignition and flashback are possible. CONFINED SPACE HAZARD. Can accumulate in hazardous amounts in low-lying areas especially inside confined spaces. COMPRESSED GAS. Contains gas under pressure. May explode if heated. ASPHYXIAN. High concentrations can displace oxygen in air and cause suffocation. May cause frostbite.

### Potential Health Effects

Main route of exposure is through inhalation.

- **Inhalation:** Low concentrations are not harmful. A high concentration can displace oxygen in the air. If less oxygen is available to breathe, symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upsets and fatigue can result. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma and death can occur. Symptoms occur more quickly with physical effort. Lack of oxygen can cause permanent damage to organs including the brain and heart. At high concentrations: can harm the nervous system. Symptoms may include headache, nausea, dizziness, drowsiness and confusion. Can cause irregular heartbeat.
- **Skin Contact:** Not irritating. Direct contact with the liquefied gas can chill or freeze the skin (frostbite). Symptoms of mild frostbite include numbness, prickling and itching. Symptoms of more severe frostbite include a burning sensation and stiffness. The skin may become waxy white or yellow. Blistering, tissue death and infection may develop in severe cases.
- **Eye Contact:** Not irritating. Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.
- **Ingestion:** Not a relevant route of exposure (gas).

- **Effects of Long-Term (Chronic) Exposure:** Not harmful.
- **Carcinogenicity:** Not a carcinogen.
- **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Not known to be a mutagen.

#### First Aid Measures

**Inhalation:** Take precautions to prevent a fire (e.g. remove sources of ignition). In case of oxygen deficiency: take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move victim to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen. If the heart has stopped, trained personnel should start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Skin Contact:** Not applicable (gas). Liquefied gas: quickly remove victim from source of contamination. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply direct heat. Gently remove clothing or jewelry that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove the rest of the garment. Loosely cover the affected area with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Eye Contact:** Not applicable (gas). Liquefied gas: move victim to fresh air. Immediately and briefly flush with lukewarm, gently flowing water. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

**Ingestion:** Not applicable (gas).

**First Aid Comments:** Some of the first aid procedures recommended here require advanced first aid training. All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

#### Fire Hazards and Extinguishing Media

**Flammable Properties:** EXTREMELY FLAMMABLE GAS. Can easily ignite. Can readily form explosive mixture with air at room temperature.

**Suitable Extinguishing Media:** Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

**Unsuitable Extinguishing Media:** DO NOT use carbon dioxide, low expansion foams, and direct application of water on liquefied gas.

**Specific Hazards Arising from the Chemical:** Gas or vapour may travel a considerable distance to a source of ignition and flash back to a leak or open container. Gas or vapour may accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a health hazard. Can displace oxygen in the air, causing suffocation. Direct addition of water to liquefied gas will cause flash vapourization resulting in an explosion (either immediately or delayed) known as a "boiling liquid,



expanding vapour explosion (BLEVE)". Heat from fire can cause a rapid build-up of pressure inside cylinders. Explosive rupture and a sudden release of large amounts of gas may result. Cylinder may rocket. In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide.

#### Stability and Reactivity Hazards

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** Open flames, sparks, static discharge, heat and other ignition sources.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with oxidizing agents (e.g. peroxides), halogens (e.g. chlorine). Not corrosive to aluminum alloys, carbon steel.
- **Hazardous Decomposition Products:** None known.
- **Possibility of Hazardous Reactions:** None known.

#### Accidental Release Measures

**Personal Precautions:** Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Evacuate downwind locations. Eliminate all ignition sources. Use grounded, explosion-proof equipment. Distant ignition and flashback are possible. Monitor area for flammable or explosive atmosphere. Before entry, especially into confined areas, check atmosphere with an appropriate monitor. Test for sufficient oxygen levels.

**Methods for Containment and Clean-up:** If possible, turn leaking container so that gas escapes rather than liquefied gas. Contact emergency services and manufacturer/supplier for advice.

**Other Information:** Contact supplier, local fire and emergency services for help. Report spills to local health, safety and environmental authorities, as required.

#### Handling and Storage Practices to Follow

**Handling:** Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Only use where there is adequate ventilation. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). In the event of a spill or leak, exit the area immediately. Never work on pressurized system. Use piping and equipment designed for high pressures and cold temperatures. Isolate and purge all equipment, piping or vessels prior to maintenance or repairs.

**NOTE:** Equipment containing propane may be contaminated with Naturally Occurring Radioactive Material (NORM) in the form of lead 210. If NORM is present, precautions to prevent inhalation, skin contact and ingestion should be taken when opening, or cleaning or doing repair work on the inner surfaces of this equipment.

**Storage:** Store in an area that is cool, well-ventilated, out of direct sunlight and away from heat and ignition sources. An approved, fire-resistant area. Separate from incompatible materials. (e.g., oxygen, chlorine gases) On the ground floor or preferably, in an isolated, detached building. Clear of combustible and flammable materials (e.g. old rags, cardboard). Electrically bond and ground containers. Ground clips must contact bare metal. Always secure (e.g. chain) cylinders in an upright position to a wall, rack or other solid structure. Avoid bulk storage indoors.

### Exposure Limit

TLV® - TWA: Simple asphyxiant\*; Explosion hazard\*\*

**Exposure Guideline Comments:** No specific TLV® = Threshold Limit Value. TWA = Time-Weighted Average.

\*Minimal oxygen content required.

\*\*Propane is a flammable asphyxiant or excursions above the TLV could approach 10% of the lower explosive limit.

### Engineering Controls

General ventilation is usually adequate. Do not allow product to accumulate in the air in work or storage areas, or in confined spaces. For large scale use of this product: use stringent control measures such as process enclosure to prevent product release into the workplace. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Use leak and fire detection equipment and an automatic fire suppression system. Provide safety shower in work area, if contact or splash hazard exists.

### PPE Required

**Eye/Face Protection:** Not required if product is used as directed.

**Skin Protection:** Protect exposed skin using insulated gloves suitable for low temperatures, long sleeves, protective apron and trousers worn outside boots or over shoes. Wear appropriate foot protection when handling cylinders. Suitable materials include the following: nitrile rubber, neoprene rubber. The following materials should NOT be used: polyvinyl chloride. Recommendations are NOT valid for very thin neoprene rubber and nitrile rubber gloves (0.3 mm or less).

### Respiratory Protection:

Up to 2100 ppm:

(APF = 10) Any supplied-air respirator

(APF = 50) Any self-contained breathing apparatus with a full facepiece

APF = Assigned Protection Factor

## Silica

### Identifying Information

**CAS Registry No.:** 14808-60-7

**Other Names:** Crystalline silica, Quartz; Silicone dioxide; Quartz

**Main Uses:** Many uses including in mining, fabrication, manufacturing, and construction

**Appearance:** Colourless crystals.

**Odour:** Odourless

**Canadian TDG:** Not specifically listed in Canadian TDG Regulations, but may be regulated as part of a chemical family or group Not Otherwise Specified (N.O.S.). Consult the regulations.

### WHMIS 1988 Classification

D2A - Very Toxic (Carcinogenicity)



Class D2A

### Emergency Overview

Colourless crystals. Odourless. Will not burn. VERY TOXIC. Prolonged or repeated exposure causes damage to lungs. CANCER HAZARD. May cause cancer, if inhaled.

### Potential Health Effects

Main routes of exposure are inhalation, skin contact, and eye contact.

- **Inhalation:** At high concentrations: can irritate the nose and throat.
- **Skin Contact:** Not irritating.
- **Eye Contact:** May cause slight irritation as a "foreign object". Tearing, blinking and mild temporary pain may occur as particles are rinsed from the eye by tears.
- **Ingestion:** Not harmful.
- **Effects of Long-Term (Chronic) Exposure:** VERY TOXIC. Can cause lung damage if the dust is breathed in. Symptoms may include shortness of breath, chronic cough and weight loss. There may be a decrease in lung function and ability to do some physical activities. In severe cases, there can be effects on the heart and death from heart failure.
- **Carcinogenicity:** CARCINOGEN. Known to cause: lung cancer.
- **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Conclusions cannot be drawn from the limited studies available.

### First Aid Measures

**Inhalation:** Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move victim to fresh air.

**Skin Contact:** Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm, gently flowing water and non-abrasive soap for 5 minutes.

**Eye Contact:** Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If irritation or pain persists, see a doctor.

**Ingestion:** Have victim rinse mouth with water. Call a Poison Centre or doctor if the victim feels unwell.

**First Aid Comments:** If exposed or concerned, see a doctor for medical advice. All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

**Note to Physicians:** Some jurisdictions specifically regulate an ingredient of this product and require a complete medical surveillance program. Specific information should be sought from the appropriate government agency in your jurisdiction.

#### Fire Hazards and Extinguishing Media

**Flammable Properties:** Does not burn.

**Suitable Extinguishing Media:** Not combustible. Use extinguishing agent suitable for surrounding fire.

**Specific Hazards Arising from the Chemical:** None known. Not known to generate any hazardous decomposition products in a fire.

#### Stability and Reactivity Hazards

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** Generation of dust.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with oxidizing agents (e.g. peroxides). Not corrosive to metals.
- **Hazardous Decomposition Products:** None known.
- **Possibility of Hazardous Reactions:** None known.

#### Accidental Release Measures

**Personal Precautions:** Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Ventilate area.

**Methods for Containment and Clean-up:** Avoid dry sweeping. If necessary, use a dust suppressant such as water. Do not use compressed air for clean-up. Collect using shovel/scoop or approved HEPA vacuum and place in a suitable container for disposal.

#### Handling and Storage Practices to Follow

**Handling:** Before handling, it is important that all engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. Only trained personnel should work with this product. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). Avoid generating dusts. Prevent accidental contact with incompatible chemicals.

**Storage:** Keep amount in storage to a minimum. Empty containers may contain hazardous residue. Store separately. Keep closed. Store in an area that is: separate from incompatible materials.

#### Exposure Limit

TLV® - TWA: 0.025 mg/m<sup>3</sup> A2 (respirable)

**Exposure Guideline Comments:** TLV® = Threshold Limit Value. TWA = Time-Weighted Average. A2 = Suspected human carcinogen.

#### Engineering Controls

If necessary, use a local exhaust ventilation and enclosure, to control amount in the air. It may be necessary to use stringent control measures such as process enclosure to prevent product release into the workplace.

#### PPE Required

**Eye/Face Protection:** Safety goggles suitable for dust protection.

**Skin Protection:** It is good practice to prevent skin contact.

#### Respiratory Protection:

Up to 0.5 mg/m<sup>3</sup>:

(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

APF = Assigned Protection Factor

When chemicals are stored or handled properly, the risk they pose is minimized – prevention is the best solution.

When a chemical spill does occur, appropriate action must be taken immediately to prevent injury to workers and others, and to minimize the potential damage to other materials and facilities.

Four steps must be followed when handling a chemical spill:

1. Communicate the hazard:

Immediately notify others working in the area and the supervisor of the hazard. If needed, evacuate the area and call 911. Follow the established emergency procedures to call for help. Be sure to indicate which material that was spilled and the quantity, to ensure appropriate clean-up.

If anyone has been injured or contaminated, they must be taken away to a safe place. If appropriate, flush contaminated areas with water while waiting for medical personnel to arrive.

2. Control the spill:

It is essential to stop the spill from becoming worse by taking appropriate actions, such as closing a valve or righting a container that has tipped over. Workers MUST put on appropriate PPE for the chemical and the nature of the hazard before handling the situation.

IMPORTANT: If possible (and appropriate), shut down any potential sources of heat or ignition. Increase ventilation to the area if that will safely disperse any fumes. If, however, the fumes present a hazard, it is usually better to isolate the area by closing doors and windows after the workplace has been evacuated.

3. Contain the hazard:

After controlling the spill, it is essential to take steps to prevent the spill from spreading to other areas or contaminating adjacent surfaces.

Confine the spilled material to a small area by using some type of absorbent material or neutralizer. Start spreading those materials around the perimeter of the spill to prevent it from expanding, and work your way to center.

Make sure to prevent the spill from spreading to floor drains or other places that may allow the material to flow into environmentally sensitive areas. It might be necessary to build a dike to block or direct the material, or use a special product such as a spill sock.

If it is necessary to leave the area, access to the spilled material must be blocked by using caution tape or some other method.

4. Clean up the spill and any damage:

Collect the material used to contain or neutralize the spill, and dispose of it in the specified manner. In case of a small spill, use a plastic bag; with large spills, use plastic pails or drums.

In some cases, it will be necessary to dispose of any equipment (brooms, dustpans, etc.) used to clean up the material. If a hazardous material was spilled, be sure to label it accordingly and dispose of it as stipulated by local laws and environmental regulations.

Use appropriate materials to clean the surfaces affected by the spill: bleach, a mild detergent, water, etc. If rinsing the area after cleaning is inappropriate, use a more absorbent material.

Hands and other areas of contact with the materials must be washed thoroughly. If clothing cannot be safely decontaminated and cleaned, it must be disposed of, following proper safety procedures.

## Occupational Health & Safety Procedures: Physical Agents

[https://www.ccohs.ca/oshanswers/phys\\_agents/](https://www.ccohs.ca/oshanswers/phys_agents/)

### Cold Environments

Working in cold environments can be not only hazardous to worker health but also life threatening. The body temperature must be maintained steady at + 37°C (+ 98.6°F) to ensure normal body functioning.

#### Heat loss

Radiation: This refers to the loss of heat to the environment due to the temperature gradient – it is the difference between the temperature of the air and the temperature of the body. The size of the surface area exposed to cold is an important factor.

Conduction: This refers to the loss of heat through direct contact with a cooler object. NOTE: The body can lose 25 to 30 times more heat when in contact with cold wet objects than in dry conditions or with dry clothing.

Convection: This refers to the loss of heat from the body to the surrounding air. The rate of heat loss from the skin depends on the air speed (the greater the speed, the greater the heat loss) and the temperature difference between the skin and the surrounding air.

Evaporation: This refers to the perspiration, including “insensible” perspiration (when body sweat is unnoticeable in cold weather), and respiration.

#### Heat production

To counterbalance heat loss that occurs in cold conditions, an equal amount of heat must be produced. Some of the ways the body produces heat include the following:

- Food intake
- "Fuel" (glycogen) store
- Fluid balance
- Physical activity
- Shivering (limited to several hours due to the depletion of muscle glycogen and the onset of fatigue)

Other factors that influence heat retention and tolerance to cold include the following:

- Person's sex (While the core body temperature cools more slowly in women, they are not usually able to create as much metabolic heat through exercise or shivering. In addition, the rate of cooling of the extremities is faster among women.)
- Size and shape of the body
- Layer of fat under the skin
- Decreased blood flow through the skin and outer parts of the body
- Insulation (layering and type of clothing)
- Diseases of the blood circulation system
- Injuries resulting in blood loss or altered blood flow
- Previous cold injury
- Raynaud's Phenomenon.
- Fatigue



- Consumption of alcohol or smoking
- Use of certain drugs or medication

#### *Cold Environments – Health Effects and First Aid*

##### **Health effects of exposure to cold**

While hypothermia – which can be fatal – is the most serious consequence of exposure to cold, various non-freezing and freezing cold injuries can occur.

Toes, fingers, ears and nose are at greatest risk because they lack major muscles that produce heat. In addition, at cold temperatures, blood flow to these areas is reduced because the body preserves heat by keeping the internal organs warm. In addition, extremities normally get cold more quickly than the rest of the body because:

- they lose heat more rapidly due to a higher surface area-to-volume ratio
- they are more likely to be in contact with colder surfaces than other parts of the body

If the eyes are not protected with goggles in high wind chill conditions, the corneas of the eyes may freeze.

#### *Nonfreezing cold injuries*

*Chilblains* are a mild cold injury caused by prolonged and repeated exposure for several hours to air temperatures that are cold, but not freezing (between 0°C or 32°F and 16°C or about 60°F). In the affected skin area there will be redness, swelling, tingling, blisters, and pain. Chilblains will usually resolve on their own, especially in warmer weather.

*Immersion foot* occurs in workers whose feet have been wet and cold (at temperatures up to 10°C or 50°F, but not freezing cold, for days or weeks. The primary injury is to nerve and muscle tissue. Symptoms include tingling and numbness; itching, pain, swelling of the legs, feet, or hands; or blisters may develop. The skin may be red initially and turn to blue or purple as the injury progresses. In severe cases, gangrene may develop.

*Trenchfoot* is "wet cold disease" resulting from prolonged exposure in a damp or wet environment from above the freezing point to about 10°C or 50°F. An onset of symptoms may range from several hours to many days (depending on the temperature), with the average of three days.

Trenchfoot is more likely to occur at lower temperatures whereas an immersion foot is more likely to occur at higher temperatures and longer exposure times.

A similar condition of the hands can occur if a person wears wet gloves for a prolonged period under cold conditions described above. Symptoms are similar to an immersion foot.

#### *Freezing cold injuries*

*Frostnip* is the mildest form of a freezing cold injury. It occurs when ear lobes, noses, cheeks, fingers, or toes are exposed to the cold, and the top layers of the skin freeze. The skin of the affected area turns paler than the area around it and it may feel pain or stinging, followed by numbness. Skin may also appear shiny and rosy, as well as hardened. The top layer of skin feels hard, but the deeper tissue still feels normal (soft). It is a warning that frostbite is beginning.

It can be prevented by wearing warm clothing and footwear. To treat a frostnip, rewarm the effected area gently (e.g., holding the affected tissue next to unaffected skin of the victim or of another person).

*Frostbite* is a common injury caused by exposure to cold or by contact with cold objects (especially those made of metal). It may also occur in normal temperatures from contact with cooled or compressed gases. Skin may look waxy and feel colder than the area around it, and be harder to the touch. Blood vessels may be severely and permanently damaged, and blood circulation may stop in the affected tissue.

In mild cases, the symptoms include inflammation of the skin in patches accompanied by pain. In severe cases, there could be tissue damage without pain, or there could be burning or prickling sensations resulting in blisters. Frostbitten skin is highly susceptible to infection, and gangrene (local death of soft tissues due to loss of blood supply) may develop.

**IMPORTANT:** With ANY cold injury, never rub the affected parts - ice crystals in the tissue could cause damage if the skin is rubbed. Do not use very hot objects such as hot water bottles to rewarm the area or person.

#### **First aid in frostbite, immersion foot or trenchfoot**

Keep the following recommendations in mind:

- Never ignore numbness. If you feel numb or tingly, take steps to warm the area immediately (e.g., put your hands under your armpits, or pull your arms into the inside of your jacket for more direct contact with the body).
- If possible, move the victim to a warm area.
- Remove wet clothing, and gently loosen or remove constricting clothing or jewellery that may restrict circulation.
- Warm the person by wrapping them in blankets or by them putting on dry clothing. Cover the head and neck. Warm the person slowly, avoiding direct heat which can burn the skin.
- Loosely cover the affected area with a sterile dressing. Place some gauze between fingers and toes to absorb moisture and prevent them from sticking together.
- If the person is alert, give them liquids to drink.
- Check for signs of hypothermia and seek medical attention. If necessary, quickly transport the victim to an emergency care facility.
- Treat the person gently and monitor breathing.
- DO NOT attempt to rewarm the affected frostbite area on site (but do try to stop the area from becoming any colder) - without the proper medical care, tissue that has been warmed may refreeze and cause more damage.
- DO NOT thaw the area if it may freeze again.
- DO NOT rub area or apply snow.
- DO NOT allow the victim to drink alcohol or smoke.

#### **Hypothermia**

##### **Hypothermia and levels of cold stress**

In moderately cold environments, the body can adapt, not allowing the body's core temperature to drop more than 1°C to 2°C below the normal 37°C. However, if an individual is exposed to intense cold without proper clothing, the body is unable to compensate for the heat loss and the body's core

temperature starts to fall. The sensation of cold followed by pain in exposed parts of the body is one the first signs of mild hypothermia.

As the temperature continues to drop or as the exposure time increases, the feeling of cold and pain starts to diminish because of increasing numbness (loss of sensation). If no pain can be felt, serious injury can occur without the victim's noticing it.

Next, muscular weakness and drowsiness are experienced. Additional symptoms of hypothermia include interruption of shivering, diminished consciousness and dilated pupils. As hypothermia progresses, severe symptoms may occur, including death.

### **Signs of hypothermia**

Cold stress (not hypothermic):

- Shivering
- Normal mental status
- Able to care for self

Mild hypothermia:

- Vigorous shivering and complaining of the cold
- Decreased physical function
- Difficulty taking care of self

Moderate hypothermia:

- Weak and intermittent shivering, or shivering that later stops
- Sometimes complaining of the cold
- Lack of coordination or speech; confused or unusual behaviours
- Impaired judgement
- Possible unresponsiveness

Severe hypothermia:

- Shivering has stopped
- Unresponsiveness; breathing has slowed down or stopped
- Body feels stiff
- No pulse

### **First aid for hypothermia**

Hypothermia is a medical emergency. At the first sign, find medical help immediately. The survival of the victim depends on their co-workers ability to recognize the symptoms of hypothermia. The victim is generally not able to notice his or her own condition.

First aid for hypothermia includes the following steps:

- Seek medical help immediately. Hypothermia is a medical emergency.
- Check for ABC - Airway, breathing and circulation.

- Handle the person gently. Do not massage or rub the skin.
- Allow them to lay down. No standing or walking.
- Move the person out of the cold, and/or insulate the person (e.g., by applying a hypothermia wrap).
- Warm by carefully applying warm water bottles, heating pads or electric blankets to the upper body (such as the armpits, chest, and upper back). Wrap items in towels or clothing if available. Body heat from another person can also help in an emergency.
- DO NOT rewarm the person too quickly (e.g., do not use a heating lamp or stove, or soak in a hot bath/shower).
- Give high calorie food or drinks (caffeine-free, non-alcoholic) ONLY if the individual has mild hypothermia (e.g., when the person is conscious and responsive).
- Perform CPR (cardiopulmonary resuscitation) if the victim stops breathing. Continue to provide CPR until medical aid is available. The body slows when it is very cold and, in some cases, hypothermia victims that have appeared "dead" have been successfully resuscitated.

### **Hypothermic wrap**

Canadian Red Cross suggests the following supplies for a hypothermia wrap:

- a tarp or plastic sheet to act as a vapour barrier
- an insulated ground pad
- a hooded sleeping bag (or equivalent)
- another plastic or foil sheet (2x3 metres) to act as a vapour barrier inside the sleeping bag
- source of heat (e.g., warm water in bottle or hydration bladder, chemical heating pads)

When the person has dry or damp clothing, leave the clothing on.

When the person has very wet clothing, if shelter and transport are:

- less than 30 minutes away, then wrap the person immediately
- more than 30 minutes away, protect the person from the environment, remove wet clothing, and apply wrap.

To apply a hypothermia wrap:

1. place an insulation pad (or pads) between the person and the ground
2. apply as much insulation as possible. Add extra clothing and wrap the person in blankets or sleeping bags
3. cover the person's head and neck with a toque, heavy hat, or hood
4. place a vapour barrier (plastic or foil) outside the insulation wrap if the person is dry. If the person is still wet, place the vapour barrier inside the insulation wrap. If you have two vapour barriers, place one inside and one outside the insulation wrap.

## Hot Environments

### *Heat Stress*

*Heat stress* is the overall heat load to which a worker may be exposed from several sources combined:

- metabolic heat (the heat produced by the body through chemical processes, exercise, hormone activity, digestion, etc.)
- environmental factors (air temperature, humidity, air movement, and radiant heat)
- clothing requirements. Body reaction to hot environments

When the environmental temperatures becomes warmer, temperature also rises. The body's internal "thermostat" maintains a constant inner body temperature by pumping more blood to the skin and by increasing sweat production – the rate of heat loss is increased to balance the heat burden. However, when it is very hot, the rate of "heat gain" is more than the rate of "heat loss", which causes the body temperature to rise, eventually leading to heat illnesses.

### *Heat gain and heat loss*

The main source of heat in normal conditions is the body's own internal heat (metabolic heat). The body exchanges heat with its surroundings mainly through the following:

- radiation - the process by which the body gains heat from surrounding hot objects (hot metal, furnaces or steam pipes), and loses heat to cold objects (chilled metallic surfaces, without contact with them).
- Convection - is the process by which the body exchanges heat with the surrounding air. The body gains heat from hot air and loses heat to cold air which comes in contact with the skin.
- evaporation of sweat - it occurs more quickly, and the cooling effect is more noticeable with high wind speeds and low relative humidity.
- conduction - the body gains or loses heat when it comes into direct contact with hot or cold objects. NOTE: Impact on heat load on the body is insignificant.
- breathing - heat is exchanged because the respiratory system warms the inhaled air. When exhaled, this warmed air carries away some of the body's heat. NOTE: Impact on heat load on the body is insignificant.

### *Effects of heat on the body*

The way a worker feels is the immediate effect of excessive heat load. As the temperature or heat burden increases, people may feel the following:

- Increased irritability.
- Loss of concentration and ability to do mental tasks.
- Loss of ability to do skilled tasks or heavy work.

To maintain body temperature, the body starts to work on balancing out the temperature difference. The following occur:

- The heart rate increases to pump more blood through outer body parts and skin.
- The body sweats.
- A worker's ability to do physical and mental work is reduced. Environmental temperature above 30°C may interfere with the performance of mental tasks.

The risk of heat-related illness varies from person to person. Factors that have an impact include the following:

- general health
- age (higher risk at 45 years and older)
- level of fitness (low level of fitness makes the person more vulnerable)
- medical conditions (those suffering from heart disease, high blood pressure, respiratory disease, diabetes, skin diseases and rashes must take extra precautions)
- substances, including prescription medication

#### *Illnesses caused by heat exposure*

*Heat edema* is swelling which generally occurs among people who are not acclimatized to working in hot conditions. Swelling is often most noticeable in the ankles. Recovery occurs after a day or two in a cool environment.

*Heat rashes* are tiny red spots on the skin which cause a prickling sensation during heat exposure. The spots are the result of inflammation caused when the ducts of sweat glands become plugged.

*Heat cramps* are sharp pains in the muscles that may occur alone or be combined with one of the other heat stress disorders. The cause is salt imbalance resulting from the failure to replace salt lost with sweat. Cramps most often occur when people drink large amounts of water without sufficient salt (electrolyte) replacement.

*Heat exhaustion* is caused by loss of body water and salt through excessive sweating. Signs and symptoms of heat exhaustion include the following: heavy sweating, weakness, dizziness, visual disturbances, intense thirst, nausea, headache, vomiting, diarrhea, muscle cramps, breathlessness, palpitations, tingling and numbness of the hands and feet. Recovery occurs after resting in a cool area and consuming cool drinks (water, clear juice, or a sports drink).

*Heat syncope* is heat-induced dizziness and fainting induced by temporarily insufficient flow of blood to the brain while a person is standing. It occurs mostly among unacclimatized people. It is caused by the loss of body fluids through sweating, and by lowered blood pressure due to pooling of blood in the legs. Recovery is rapid after rest in a cool area.

*Heat stroke* is the most serious type of heat illness. Signs of heat stroke include body temperature often greater than 41°C, and complete or partial loss of consciousness. Sweating is not a good sign of heat stress as there are two types of heat stroke - "classical" where there is little or no sweating (usually occurs in children, persons who are chronically ill, and the elderly), and "exertional" where body temperature rises because of strenuous exercise or work and sweating is usually present.

**IMPORTANT:** Heat stroke requires immediate first aid and medical attention. Delayed treatment may result in death.

#### *Symptoms and first aid for heat exhaustion*

Symptoms of heat exhaustion may start suddenly, and include the following:

- Nausea or irritability
- Dizziness

- Muscle cramps or weakness
- Feeling faint
- Headache
- Fatigue
- Thirst
- Heavy sweating
- High body temperature

First aid for heat exhaustion includes the following:

- Get medical aid. Stay with the person until help arrives.
- Move to a cooler, shaded location.
- Remove as many clothes as possible (including socks and shoes).
- Apply cool, wet cloths or ice to head, face or neck. Spray with cool water.
- Encourage the person to drink water, clear juice, or a sports drink.

#### *Symptoms and first aid for heat stroke*

Heat exhaustion may quickly develop into heat stroke. Symptoms of heat stroke include:

- Hot, dry skin or profuse sweating.
- Confusion.
- Loss of consciousness.
- Seizures.
- Very high body temperature.

First aid for heat stroke includes:

- **Call 911 immediately. Heat stroke is a medical emergency.**
- Stay with the person until help arrives.
- Move to a cooler, shaded location.
- Remove as many clothes as possible (including socks and shoes).
- Wet the person's skin and clothing with cool water.
- Apply cold, wet cloths or ice to head, face, neck, armpits, and groin.
- Do not try to force the person to drink liquids.

#### *Preventing heat related illness*

**Salt and Fluid Supplements:** A person working in a very hot environment loses water and salt through sweat. This loss should be compensated by water and salt intake. Fluid intake should equal fluid loss.

On average, about one litre of water each hour may be required to replace the fluid loss. Plenty of cool (10-15°C) drinking water should be available on the job site, and workers should be encouraged to drink water every 15 to 20 minutes even if they do not feel thirsty. Alcoholic drinks should NEVER be taken as alcohol dehydrates the body.

An acclimatized worker loses relatively little salt in their sweat and, therefore, the salt in the normal diet is usually sufficient to maintain the electrolyte balance in the body fluids. For unacclimatized workers who may sweat continuously and repeatedly, additional salt in the food may be used. Salt tablets are

not recommended because the salt does not enter the body system as fast as water or other fluids. Too much salt can cause higher body temperatures, increased thirst and nausea. Workers on salt-restricted diets should discuss the need for supplementary salt with their doctor.

**Sport drinks, fruit juice, etc:** Drinks specially designed to replace body fluids and electrolytes may be taken but for most people, they should be used in moderation. They may be of benefit for workers who have very physically active occupations but keep in mind they may add unnecessary sugar or salt to your diet. Fruit juice or sport and electrolyte drinks, diluted to half the strength with water, is an option. Drinks with alcohol or caffeine should never be taken, as they dehydrate the body. For most people, water is the most efficient fluid for re-hydration.

**Emergency Action Plan:** In extreme environments, an emergency plan is needed. The plan should include procedures for providing affected workers with first aid and medical care.

### *Measuring occupational heat exposure*

Feeling of hot or cold depends on the following:

- Air temperature.
- Relative humidity of air.
- Presence of hot or cold objects in the surrounding area.
- Presence of air movement (breeze, ventilation).
- Physical exertion.
- Clothing.

Various methods of measuring occupational heat exposure combine these environmental factors to obtain a single number as a measure of overall heat load. The most commonly used measure in the workplace is the wet bulb globe temperature (WBGT) index.

### *The Wet Bulb Globe Temperature (WBGT)*

The wet bulb globe temperature is calculated using a formula that takes into account air temperature, speed of air movement, radiant heat from hot objects, sunshine and body cooling due to sweat evaporation.

- Air temperature is measured using a conventional thermometer.
- The contribution due to radiant heat is measured using a black globe thermometer. A conventional thermometer is inserted through a rubber stopper into a hollow, six-inch diameter copper ball which is coated with a flat black paint. The thermometer bulb is positioned at the centre of the copper ball. The black globe thermometer normally requires at least 20 minutes to come to equilibrium reading.
- The cooling effect of evaporation and air movement is taken into account using a natural wet bulb thermometer. A natural wet bulb thermometer is a conventional thermometer with its bulb wrapped with an absorbent cotton wick. The wick extends 30 to 35 millimetres above the thermometer bulb, and the lower end of the wick is immersed in distilled water. About 25 mm



of moistened wick is exposed between the water and the bulb of the thermometer. The moist wick continuously provides water for evaporation. As with the black globe thermometer, the natural wet bulb thermometer also requires at least 20 minutes to reach equilibrium.

Two different methods are used to calculate WBGT in the workplace: one for workplaces with direct sunlight, and the other for workplaces without direct sunlight.

When conditions of the workplace fluctuate widely, it is common to use time weighted WBGT.

#### *Calculating the WBGT*

The wet bulb globe temperature (WBGT) is calculated by using the following equations.

- For outdoors **with** direct sun exposure:

$$\text{WBGT} = 0.7 \times \text{Temp}_{\text{wet bulb}} + 0.2 \times \text{Temp}_{\text{globe}} + 0.1 \times \text{Temp}_{\text{air}}$$

- For indoors or outdoors **without** direct sun exposure:

$$\text{WBGT} = 0.7 \times \text{Temp}_{\text{wet bulb}} + 0.3 \times \text{Temp}_{\text{globe}}$$

where:

Temp<sub>wet bulb</sub> natural wet bulb temperature measured by using a thermometer whose bulb is covered with wet cotton cloth and is cooled by the natural air movement

Temp<sub>globe</sub> temperature measured using a black globe thermometer

Temp<sub>air</sub> temperature measured using a conventional thermometer

All temperatures are to be expressed in °C.

#### **Example**

Workers employed in an outdoor workplace with direct exposure to the sun. Measurement of workplace conditions produced the following results.

$$\text{Temp}_{\text{wet bulb}} = 24^{\circ}\text{C}$$

$$\text{Temp}_{\text{globe}} = 42^{\circ}\text{C}$$

$$\text{Temp}_{\text{air}} = 40^{\circ}\text{C}$$

$$\text{WBGT} = 0.7 \times 24 + 0.2 \times 42 + 0.1 \times 40 = 29.2^{\circ}\text{C}$$

#### **Time-Weighted Average (TWA)**

When thermal conditions of the workplace fluctuate widely, time-weighted average (TWA) WBGT is used to assess heat exposure.

$$\text{TWA WBGT} = \frac{\text{WBGT}_1 \times t_1 + \text{WBGT}_2 \times t_2 + \dots + \text{WBGT}_n \times t_n}{t_1 + t_2 + \dots + t_n}$$

WBGT<sub>1</sub>, WBGT<sub>2</sub>, etc. the wet bulb globe temperatures measured or calculated

t<sub>1</sub>, t<sub>2</sub>, etc. the elapsed time spent in the corresponding conditions described by WBGT<sub>1</sub>, WBGT<sub>2</sub>, etc., respectively.

### Example

Measurement and/or calculation of WBGT during a two-hour job produced the following results.

Exposure duration (hours)	WBGT (°C)
0.5	25
1.0	27
0.5	28

These data would yield the following time-weighted average.

$$\text{TWA WBGT} = \frac{25 \times 0.5 + 27 \times 1.0 + 28 \times 0.5}{0.5 + 1.0 + 0.5} = 26.75^\circ\text{C}$$

### *Control measures for heat effects reduction*

The risk of heat-related illnesses can be reduced by the following:

- Engineering controls to provide a cooler workplace.
- Safe work practices to reduce worker exposure.
- Training employees to recognize and prevent heat illnesses.

### *Engineering Controls*

Engineering controls are the most effective means of reducing excessive heat exposure.

- **Reducing Metabolic Heat Production (heat produced by the body):** Automation and mechanization of tasks minimize the need for heavy physical work and the resulting buildup of body heat.
- **Reducing the Radiant Heat Emission from Hot Surfaces:** Covering hot surfaces with sheets of low emissivity material such as aluminum or paint that reduces the amount of heat radiated from this hot surface into the workplace.
- **Insulating Hot Surfaces:** Insulation reduces the heat exchange between the source of heat and the work environment.
- **Shielding:** Shields stop radiated heat from reaching workstations. Two types of shields can be used. Stainless steel, aluminum or other bright metal surfaces reflect heat back towards the

source. Absorbent shields, such as a water-cooled jacket made of black-surfaced aluminum, can effectively absorb and carry away heat.

- **Ventilation and Air Conditioning:** Ventilation, localized air conditioning, and cooled observation booths are commonly used to provide cool workstations. Cooled observation booths allow workers to cool down after brief periods of intense heat exposure while still allowing them to monitor equipment.
- **Reducing the Humidity:** Air conditioning, dehumidification, and elimination of open hot water baths, drains, and leaky steam valves help reduce humidity.

### Personal Protection

Regular clothes offer some protection from heat radiated by surrounding hot surfaces. For working in extremely hot conditions, specially designed heat-protective clothing is available. In hot and humid workplaces, light clothing allows maximum skin exposure and efficient body cooling by sweat evaporation.

Long underwear moderates the extremes in temperatures when workers who move back and forth between very hot, dry indoor environments and cold winter outdoor environments.

Eye protection which absorbs radiation is needed when the work involves very hot objects, such as molten metals and hot ovens.

Work that requires the wearing of impermeable clothing presents an added heat burden as the clothing reduces the body's ability to dissipate heat. Under such circumstances, it is often necessary to reduce the exposure limit values of WBGT to levels below those appropriate for workers wearing light clothing.

### Acclimatization to heat

Acclimatization is the process of the body adapting to a new thermal environment. Complete heat acclimatization generally takes six to seven days, but some individuals may need longer.

Loss of acclimatization occurs gradually when a person is moved permanently away from a hot environment. However, a decrease in heat tolerance occurs even after a long weekend. As a result of reduced heat tolerance, it is often not advisable for anyone to work under very hot conditions on the first day of the week.

New employees should acclimatize before assuming a full workload. It is advisable to assign about half of the normal workload to a new employee on the first day of work and gradually increased on subsequent days.

### Humidex

Humidex is a measure of how hot we feel. It is a parameter intended for the general public to express how the combined effects of warm temperatures and humidity are perceived.

Environment Canada uses humidex ratings to inform the general public when conditions of heat and humidity are possibly uncomfortable.

Table 1	
Humidex Range	Degree of Comfort
20-29	comfortable
30-39	some discomfort
40-45	great discomfort; avoid exertion
above 45	dangerous; heat stroke possible

**Source:** Warm season weather hazards. Government of Canada

#### *Impact of humidity*

In hot weather, the body cools itself by producing sweat, which cools the body as it evaporates. When the air becomes more humid, sweat evaporation slows down and stops completely when the relative humidity reaches about 90 percent. Under these circumstances, the body temperature rises and may cause illness.

#### *Using humidex to monitor conditions*

Humidex expresses the combined effects of warm temperatures and humidity, but heat-related illnesses depend on many workplace factors in addition to air temperature and humidity. Wind speed or air movement, workload, radiant heat sources and a person's physical condition are also important.

Under certain workplace conditions, the humidex may serve as an indicator of discomfort resulting from occupational exposures to heat. For example, when humidity is high, but when workload, wind speed and radiant heat sources do not significantly contribute to the heat burden, humidex may be useful (office environments are an example).

**NOTE:** It is important to use the values of the temperature and relative humidity obtained by actual measurements taken in the workplace.

### Recommended Actions Based on the Humidex Reading

Humidex 1 – Moderate physical work, unacclimatized worker, OR Heavy physical work, acclimatized worker	Response	Humidex 2 – Moderate physical work, acclimatized worker, OR Light physical work, unacclimatized worker
25 - 29	• supply water to workers on an "as needed" basis	32 - 35
30 - 33	• post Heat Stress Alert notice • encourage workers to drink extra water • start recording hourly temperature and relative humidity	36 - 39
34 - 37	• post Heat Stress Warning notice • notify workers that they need to drink extra water • ensure workers are trained to recognize symptoms	40 - 42
38 - 39	• work with 15 minutes relief per hour can continue • provide adequate cool (10 - 15°C ) water • at least 1 cup (240 mL) of water every 20 minutes • workers with symptoms should seek medical attention	43 - 44
40 - 41	• work with 30 minutes relief per hour can continue in addition to the provisions listed previously	45 - 46*
42 - 44	• if feasible, work with 45 minutes relief per hour can continue in addition to the provisions listed above	47 - 49
45 or over	• only medically supervised work can continue	50* and over

Source: Occupational Health Clinics for Ontario Workers (OHCOW) – "Humidex Based Heat Response Plan"

### Thermal Comfort at the Office

#### Thermal comfort – definition

*Thermal comfort* refers to feeling neither too cold nor too warm while wearing a normal amount of clothing. It is essential for a person's well-being and productivity.

An office which is too warm makes its occupants feel tired; one that is too cold causes the occupants' attention to drift, making them restless and easily distracted. Even minor deviation from comfort may be stressful and affect performance and safety. Workers already under stress are even less tolerant of uncomfortable conditions.

#### Factors that influence thermal comfort

A range of factors have an impact on thermal comfort:

- Metabolic rate and/or activity level (of the persons in the room): varies with the number of occupants, and the amount of activity done by occupants (e.g., sitting in a restaurant versus serving the customers).
- Clothing: varies by individual's choices in clothing or by work requirements (e.g., chemical protective clothing or rain gear).
- Air temperature.
- Radiant temperature: a complex term, but generally described as how the heat transfers between the body and other objects in the area (e.g., radiation is the process by which the body gains heat from surrounding hot objects, such as hot metal, furnaces or steam pipes, and loses heat to cold objects, such as chilled metallic surfaces, **without contact** with them).
- Solar loading.
- Air speed (velocity): the rate of air movement.
- Humidity: a general description of the moisture content of the air.

#### *Recommended office temperature*

- Summer conditions: optimum temperature of 24.5°C with an acceptable range of 23-26°C
- Winter conditions: optimum temperature of 22°C with an acceptable range of 20-23.5°C

#### *Recommended office humidity level*

A relative humidity between 40% and 70% does not have a major impact on thermal comfort.

Relative humidity levels below 20% can cause discomfort through drying of the eyes and mucous membranes and skin. Low relative humidity levels may also cause static electricity build-up and negatively affect the operations of some office equipment such as printers and computers.

Relative humidity levels above 70% may lead to the development of condensation on surfaces and within the interior of equipment and building structures, as well as mould and fungi. Higher humidity also makes the area feel stuffy.

#### *Impact of air velocity*

Air velocity can be created by the air conditioning or ventilation system, and by cold surfaces (e.g., air flowing towards the floor). Thermal comfort is affected by this air movement. Drafts, especially on the head region (head, neck, and shoulders) and leg region (ankles, feet, legs) can cause discomfort.

Temperatures considered in the comfort zone will increase with increased air speed.

#### *Other factors*

Thermal comfort also depends on the metabolic rates (activities being done), the clothing a person wears, and radiant temperatures of other surfaces.

Radiant temperature sources include floors and windows. Humans are most sensitive to warm ceilings, and to cold vertical surfaces such as windows. Floor surface temperatures that are too high or too low, and that are different than air temperatures also contribute to thermal discomfort.

## Noise

### *Sound vs noise*

Sound is what we hear, while noise is unwanted sound. Sound is produced by vibrating objects and reaches the listener's ears as waves in the air or other media. When an object vibrates, it causes slight changes in air pressure. These air pressure changes travel as waves through the air and produce sound.

### *Noise – a workplace hazard*

Permanent hearing loss is the main health concern. In noisy offices, schools and similar locations, the main concerns are annoyance, stress and interference with speech communication.

To prevent adverse outcomes of noise exposure, noise levels should be reduced to acceptable levels. As a first step in dealing with noise, workplaces need to identify areas or operations where excessive exposure to noise occurs.

The best method of noise reduction is to use engineering modifications to the noise source itself, or to the workplace environment. When that is not possible, personal hearing protection (earmuffs or plugs) can be used. Personal protection, however, should be considered as a temporary measure while other means of reducing workplace noise are being explored and implemented.

### *Is the workplace too loud?*

The workplace does have a noise problem if any of the following questions receive an affirmative answer:

- Do people have to raise their voices?
- Do people who work in noisy environments have ringing in their ears at the end of a shift?
- Do they find when they return home from work that they have to increase the volume on their car radio higher than they did when they went to work?
- Does a person who has worked in a noisy workplace for years have problems understanding conversations at parties, or restaurants, or in crowds where there are many voices and "competing" noises?

If there is a noise problem in a workplace, then a noise assessment or survey should be undertaken to determine the sources of noise, the amount of noise, who is exposed and for how long.

### *Measurable properties of noise*

The properties of noise which are important in the workplace are:

- frequency
- sound pressure
- sound power
- time distribution

### *Kinds of noise*

Noise can be continuous, variable, intermittent or impulsive depending on how it changes over time.

- Continuous noise – remains constant and stable over a given time period.
- Intermittent noise – a mix of relatively quiet and noisy periods.
- Impulsive (impact) noise – a very short burst of loud noise which lasts for less than one second.

## Vibration

### *Measuring vibration exposure*

Vibration is the mechanical oscillations of an object about an equilibrium point. The oscillations may be regular (the motion of a pendulum) or random (the movement of a tire on a gravel road). The study of health effects of vibration requires measures of the overall "pressure waves" (vibration energy) generated by the vibrating equipment or structure.

### **Measuring vibration – instrumentation**

A typical vibration measurement system includes a device to sense the vibration (accelerometer), and an instrument to measure the level of vibration. This equipment also has settings for measuring frequency, a frequency-weighting network, and a display such as a meter, printer or recorder.

The accelerometer produces an electrical signal. The size of this signal is proportional to the acceleration applied to it. The frequency-weighting network mimics the human sensitivity to vibration of different frequencies. The use of weighting networks gives a single number as a measure of vibration exposure and is expressed as the frequency-weighted vibration exposure in metres per second squared ( $\text{m/s}^2$ ) units of acceleration

### **Type of vibration exposure**

Vibration enters the body from the part of the body or organ in contact with vibrating equipment. When a worker operates hand-held equipment, such as a chain saw or jackhammer, vibration affects hands and arms – a *hand-arm vibration exposure*. When a worker sits or stands on a vibrating floor or seat, the vibration exposure affects almost the entire body – a *whole-body vibration exposure*.

### **Risk of injury**

The risk of vibration induced injury depends on the average daily exposure. An evaluation of the risk takes into account the intensity and frequency of the vibration, the duration (years) of exposure and the part of the body which receives the vibration energy.

Hand-arm vibration causes damage to hands and fingers. It appears as damage to blood vessels, nerves and joints in the fingers. The resulting condition is known as white finger disease, Raynaud's phenomenon or hand-arm vibration syndrome (HAVS). One of the symptoms is that affected fingers may turn white, especially when exposed to cold. Vibration-induced white finger disease also causes a loss of grip force and loss of sensitivity to touch.

The health effect of whole-body vibration (WBV) is not yet clear. Studies of drivers of heavy vehicles have revealed an increased incidence of the disorders of bowel and the circulatory, musculoskeletal and neurological systems. However, such disorders are not specific to whole-body vibration exposure only.

### *Vibration vs resonance*

### **Vibration**

Any vibration has two measurable quantities. How far (*amplitude or intensity*), and how fast (*frequency*) the object moves helps determine its vibrational characteristics.

*Acceleration* is the measure of vibration intensity. The speed of a vibrating object varies from zero to a maximum during each cycle of vibration. It moves fastest as it passes through its natural stationary position to an extreme position. The vibrating object slows down as it approaches the extreme, where it



stops and then moves in the opposite direction through the stationary position toward the other extreme. Speed of vibration is expressed in units of metres per second (m/s).

### Resonance

Every object tends to vibrate at one particular frequency called the *natural frequency*. The measure of natural frequency depends on the composition of the object, its size, structure, weight and shape. If we apply a vibrating force on the object that has a frequency equal to the natural frequency of the object, it is a *resonance condition*. A vibrating machine transfers the maximum amount of energy to an object when the machine vibrates at the object's *resonant frequency*.

### Health effects of vibration

Vibration induced health conditions progress slowly. In the beginning it usually starts as a pain. As the vibration exposure continues, the pain may develop into an injury or disease. Pain is the first health condition that is noticed and should be addressed in order to stop the injury.

### Health effects of hand-arm vibration

Vibration-induced white finger (VWF) is the most common condition among the operators of hand-held vibrating tools. The symptoms of VWF are aggravated when the hands are exposed to cold.

Vibration can cause changes in tendons, muscles, bones and joints, and can affect the nervous system. Collectively, these effects are known as Hand-Arm Vibration Syndrome (HAVS), also known as Raynaud's phenomenon. Workers affected by HAVS commonly report:

- attacks of whitening (blanching) of one or more fingers when exposed to cold
- tingling and loss of sensation in the fingers
- loss of light touch
- pain and cold sensations between periodic white finger attacks
- loss of grip strength
- bone cysts in fingers and wrists

The development of HAVS is gradual and increases in severity over time. It may take a few months to several years for the symptoms of HAVS to become clinically noticeable.

### Symptoms of HAVS

Hand-arm vibration exposure affects the blood flow (vascular effect) and causes loss of touch sensation (neurological effect) in fingers.

A common method that is used to classify VWF is the Stockholm Workshop classification scale.

<b>Table 1</b>		
<b>The Stockholm Workshop classification scale</b>		
<b>for cold-induced peripheral vascular and sensorineural symptoms</b>		
<b>(a) Vascular assessment</b>		
<b>Stage</b>	<b>Grade</b>	<b>Description</b>
0	(none)	No attacks
1	Mild	Occasional attacks affecting only the tips of one or more fingers

2	Moderate	Occasional attacks affecting finger tips and middle of the finger (distal and middle phalanges), and also rarely affects the parts of the finger close to the palm (proximal phalanges)
3	Severe	Frequent attacks affecting all parts of most fingers (all phalanges)
4	Very Severe	Same symptoms as in stage 3 with skin changes in the finger tips.

<b>(b) Sensorineural assessment</b>	
<b>Stage</b>	<b>Symptoms</b>
OSN	Exposed to vibration but no symptoms
1SN	Intermittent numbness, with or without tingling
2SN	Intermittent or persistent numbness, reduced sensory perception
3SN	Intermittent or persistent numbness, reduced tactile discrimination and/or manipulative dexterity

Source: Gemne, G., et al. Scandinavian Journal of Work, Environment and Health. Vol. 13, no. 4 (1987). p. 275-278. And: American Conference of Governmental Industrial Hygienists (ACGIH). 2016 TLVs® and BEIs®. p. 190-194 and 198-204.

The severity of hand-arm vibration syndrome depends on several other factors, such as the characteristics of vibration exposure, work practice, personal history and habits. Table 2 summarizes these factors.

<b>Table 2</b>		
<b>Factors that influence the effect of vibration on the hand</b>		
<b>Physical Factors</b>	<b>Biodynamic Factors</b>	<b>Individual Factors</b>
Acceleration of vibration	Grip forces - how hard the worker grasps the vibrating equipment	Operator's control of tool
Frequency of vibration	Surface area, location, and mass of parts of the hand in contact with the source of vibration	Ability to change or vary the work rate of the machine
Duration of exposure each workday	Hardness of the material being contacted by the hand-held tools, for example metal in grinding and chipping	Skill and productivity
Years of employment involving vibration exposure	Position of the hand and arm relative to the body	Individual susceptibility to vibration
State of tool maintenance	Texture of handle-soft and compliant versus rigid material	Smoking and use of drugs. Exposure to other physical and chemical agents.
Protective practices and equipment including gloves, boots, work-rest periods.	Medical history of injury to fingers and hands, particularly frostbite	Disease or prior injury to the fingers or hands

#### Health effects of whole-body vibration

Whole-body vibration can cause fatigue, stomach problems, headache, loss of balance and "shakiness" shortly after or during exposure.

After daily exposure over a number of years, whole-body vibration can affect the entire body and result in a number of health disorders, such as circulatory, bowel, respiratory, muscular and back disorders. The combined effects of body posture, postural fatigue, dietary habits and whole-body vibration are the possible causes for these disorders.

Many studies have reported decreased performance in workers exposed to whole-body vibration.

#### *Amount of vibration exposure*

Three important factors affect the health effects that can result from exposure to vibration:

- the threshold value or the amount of vibration exposure that results in no adverse health effects
- the dose-response relationship (how the severity of the ill health effects is related to the amount of exposure)
- latent period (time from first exposure to appearance of symptoms)

#### *Controlling exposure to vibration*

Protecting workers from the effects of vibration usually requires a combination of appropriate tool selection, the use of appropriate vibration-absorbing materials, good work practices, and training programs.

#### *Anti-Vibration Tools*

Tools can be designed or mounted in ways that help reduce the vibration level. For example, using anti-vibration chain saws reduces acceleration levels by a factor of about 10.

These types of chain saws must be well maintained. Maintenance must include periodic replacement of shock absorbers.

Some pneumatic tool companies manufacture anti-vibration tools such as anti-vibration pneumatic chipping hammers, pavement breakers and vibration-damped pneumatic riveting guns.

#### *Anti-Vibration Gloves*

Anti-vibration gloves are made using a layer of viscoelastic material (unlike traditional protective gloves made of cotton or leather). When the vibration hazard **cannot be removed or controlled adequately**, Personal Protective Equipment (PPE) such as anti-vibration gloves may be used.

#### *Safe Work Practices*

Along with using anti-vibration tools and gloves, workers can reduce the risk of hand-arm vibration syndrome (HAVS) by following work practices:

- Use a minimum strength hand grip that still allows the safe operation of the tool or process.
- Wear sufficient clothing, including gloves, to keep warm.
- Avoid continuous exposure by taking rest periods.
- Rest the tool on the work piece whenever practical.
- Do not use faulty tools.
- Maintain tools properly. Tools that are worn, blunt or out of alignment will vibrate more.
- Consult a doctor at the first sign of vibration disease and ask about the possibility of changing to a job with less exposure.

### Employee Training

Training programs are an effective means of heightening the awareness of HAVS in the workplace. Training should include proper use and maintain vibrating tools to avoid unnecessary exposure to vibration. Vibrating machines and equipment often produce loud noise as well. Therefore, training and education in controlling vibration should also include training about noise control.

### Whole-Body Vibration

The following precautions help to reduce whole-body vibration exposure:

- Limit the time spent by workers on a vibrating surface.
- Mechanically isolate the vibrating source or surface to reduce exposure.
- Ensure that equipment is well maintained to avoid excessive vibration.
- Install vibration damping seats.

The vibration control design is an intricate engineering problem and must be set up by qualified professionals. Many factors specific to the individual workstation govern the choice of the vibration isolation material and the machine mounting methods.

### Exposure standards

#### Standards for hand-arm vibration

The American Conference of Governmental Industrial Hygienists (ACGIH) has developed Threshold Limit Values (TLVs) for hand-arm vibration exposure. The 2016 edition refers to a daily vibration exposure (8-hour equivalent total value) of 5 metres/sec<sup>2</sup> to represent conditions where it is believed that most workers may be exposed repeatedly without progressing beyond Stage 1 of the Stockholm Workshop Classification System for Vibration-Induced White Finger.

#### Standards for whole-body vibration

The American Conference of Governmental Industrial Hygienists (ACGIH) has developed Threshold Limit Values (TLVs) for whole-body vibration exposure. The 2016 edition refers to the ISO Standard 2631-1 “Mechanical vibration and shock - Evaluation of human exposure to whole-body vibration” (published in 1997, and confirmed current in 2014). The Standard focuses on the possible effects of vibration on health, comfort and perception, and on the incidence of motion sickness. They caution that vibration is often complex, contains many frequencies, occurs in several directions, and changes over time.

The ACGIH TLVs use a “curve” which compares ISO 2631 Health Guidance Caution Zones, the weighted acceleration, and the exposure time, as well as a series of calculations to assist users. Use of the ACGIH and/or ISO guidelines directly is recommended.

## Occupational Health & Safety Procedures: Biological Agents

[https://www.ccohs.ca/oshanswers/biol\\_hazards/](https://www.ccohs.ca/oshanswers/biol_hazards/)

### Common Cold

#### *Common cold – definition*

The common cold is an infection of the upper respiratory tract - the nose, nasal passages and the throat. There are more than 200 viruses that can cause colds. The primary family of viruses that cause common colds in adults are the rhinoviruses. There are more than one hundred kinds of rhinoviruses.

#### *Common cold – symptoms*

Symptoms usually show up about two days after a person becomes infected. Early signs of a cold are a sore, scratchy throat, sneezing, and a runny nose. Other symptoms that may occur later include headache, stuffy nose, watering eyes, hacking cough, chills, muscle aches, and general ill-feeling lasting from 2 to 7 days. Some cases may last for two weeks. The common cold may be accompanied by:

- laryngitis (inflammation of the larynx or "voice box")
- tracheitis (inflammation of the membrane lining the trachea or "wind pipe")
- bronchitis (inflammation of the bronchial membranes)
- ear infection or
- worsening of asthma
- sinusitis (inflammation of sinus membranes) and
- pneumonitis (inflammation of the lungs)

When people are infected, they can be asymptomatic (i.e., showing no symptoms); this is called a sub-clinical infection since the infection is not causing a disease. Most people with colds show mild symptoms but severe colds can send one to bed with all the nasty symptoms of headache, fever, aches and pains all over, stuffy nose and coughing.

#### *Common cold – transmission*

Close personal and prolonged contact are necessary for the cold viruses to spread. The viruses must get into the nose where they can infect the nasal membranes. The virus must attach to nasal cells after which the viruses can multiply. Inhaling contaminated droplets produced when someone else coughs or sneezes may be one way to catch a cold.

Cold viruses can remain infective even if they are outside the body for a few hours. It is possible to catch a cold when handling something that is contaminated with a cold virus and then sticking the contaminated finger up the nose or rubbing the eyes.

#### *Common cold – treatment*

There is no cure for the common cold. Good health habits are important in preventing the spread of the common cold including:

- frequent hand washing with soap and water
- avoid close contact with sick people
- cover your nose and mouth when sneezing and coughing
- avoid touching eyes, nose and mouth
- clean and disinfect surfaces likely to be contaminated and touched by others

## Influenza

### *Influenza – definition*

Influenza, commonly called "the flu", is a contagious disease caused by viruses that infect the respiratory tract including nose, throat, and lungs. Influenza causes severe illness and life-threatening complications in many people.

There are four types of viruses called influenza A, B, C and D. Influenza types A and B are responsible for the seasonal disease that occurs almost every winter. Influenza type C usually causes a very mild disease often without symptoms. Influenza type D viruses affect cattle and are not known to cause illness in people.

Influenza type A viruses are classified into subtypes and each subtype is further divided into strains. Only influenza A viruses have caused pandemics.

The H and N letters refer to the different kinds of proteins found on the outside surface of the influenza virus. The various subtypes of type A influenza virus depend on the kinds of proteins that stick out from the surface of the virus – the haemagglutinin or HA protein and the neuraminidase or the NA protein. The body's immune system can make antibodies that can recognize these specific virus proteins (antigens) and therefore fight that specific influenza virus.

Researchers have found 18 kinds of HA proteins and 11 NA proteins in many combinations in bird flu viruses. These combinations are reported as strains of the influenza virus H(number) N(number). For example: H7N1, H9N2, H5N1, etc.

Influenza type B virus is not divided into subtypes, but can be documented as strains.

### *Influenza – symptoms*

It can take 1 to 4 days for symptoms to appear after exposure to the virus. The symptoms of influenza include fever (39°C and above), cough, and muscle aches. Other common symptoms include sore throat, runny nose, headache, chills, loss of appetite, and fatigue. Some adults will also experience stomach ache, vomiting and diarrhea, but these symptoms are more common with children.

Most people who get the flu recover completely in 7 to 10 days. However, some people especially the elderly and those with chronic health problems can develop serious complications. These complications include pneumonia and aggravation of pre-existing medical conditions such as congestive heart failure, asthma, or diabetes.

### *Influenza – transmission*

The influenza viruses mainly are spread from person to person through droplets produced while coughing or sneezing. Droplets of an infected person are propelled by coughing, sneezing, and talking into the air and are deposited on the mouth or nose of people nearby. This droplet transmission of the flu is known as contact transmission.

The influenza viruses can also be transmitted by indirect contact by touching a contaminated object or surface and then touching your own mouth, eyes or nose before washing your hands. This action is also called fomite transmission – a fomite is any surface or inanimate thing (doorknobs, phones, etc.) that can carry an agent after an infected person contaminated it by touching it or sneezing on it.

### *Influenza – prevention*

Influenza can be prevented by annual vaccination. In Canada, the National Advisory Committee on Immunization (NACI) recommends that all Canadians older than six months get a flu shot.

The influenza vaccine is highly recommended for the following people due to a higher risk of hospitalization:

- Adults (including pregnant women) and children with chronic heart or lung disease.
- People of any age who are residents of nursing homes and other long-term care facilities.
- People over the age of 65 years.
- Children between 6 months and 5 years.
- People with health conditions such as diabetes, cancer, heart disease, lung disease, obesity, etc.
- Healthy pregnant women.
- Indigenous peoples.

The vaccine is also recommended for people who are capable of transmitting influenza to those at high risk (health care workers, those providing essential community services, etc.).

Another way to prevent influenza is to follow hygiene practices:

- Wash hands after contact with respiratory droplets and contaminated objects. (Frequent hand washing with appropriate hand care to prevent skin irritation.)
- Cover your mouth and nose with your arm (not your hand) when coughing or sneezing.
- Use tissues to contain respiratory droplets.
- Keep your hands away from your face (viruses enter the body through your nose, mouth and eyes).
- Clean commonly touched surfaces such as doorknobs, or light switches. Regular household cleaners and disinfectants are appropriate.
- If you think you are sick, stay home.

## Occupational Health & Safety Procedures: Musculoskeletal Disorders Prevention

### Musculoskeletal Disorder – definition

Musculoskeletal disorders (MSD) refer to conditions that involve the nerves, tendons, muscles, and ligaments. These conditions can cause workers to feel pain, numbness, tingling, or weakness while performing tasks. MSDs can also cause swelling, redness, and difficulty when moving body parts.

Work-related MSDs include injuries:

- to the muscles, nerves, tendons and joints
- most frequently to the fingers, wrists, arms, shoulders and back
- that develop over time
- from tasks that repeatedly cause stress and injury to tissues
- that develop when there is not enough time for tissues to recover and heal.

MSD is a generic term that actually refers to a number of different injuries and disorders of the muscles, tendons, nerves, and bodily supporting structures. Other similar terms include:

- Repetitive strain injury (RSI),
- Cumulative trauma disorder (CTD),
- Work-related musculoskeletal disorder (WMSD),
- Musculoskeletal injury (MSI),
- Occupational overuse syndrome (OOS), and
- Sprains and strains.



## Musculoskeletal Disorder – Risk Factors

Five common risk factors can potentially lead to the development of an MSD: force and contact stress, repetition and duration, posture, grip, as well as temperature and vibration.

### *Force and Contact Stress*

Force is an exertion of pressure on a given area, and is required for the following three types of activities:

1. Pushing or pulling
2. Lifting, lowering, restraining, carrying, and holding
3. Gripping

### Force Stress

When force is applied to an object to complete a task, pressure is placed on joints, bones, ligaments and other supporting structures within your body. If this pressure is too high for the body to safely handle it, these structures may experience some type of damage. When this occurs, the body part is considered to be overexerted or overused.

The use of excessive force while performing a work task can occur due to poor work practices or poor job design. Inappropriate work practices are often used because they are perceived to be quicker and less strenuous.

### Contact Stress

This type of stress is the result of pressure exerted on the body from carrying a load. Large pressure can be exerted on body parts that are not used to heavy loads, when improper postures are used.

### *Repetition and Duration*

Muscles will fatigue, and tissue damage may occur when the same body parts are used for extended periods of time or repeatedly, without resting.

NOTE: Injuries from repetition can happen even if the force requirements of the task are low, and a proper posture is used. This occurs because the same muscle group is used, which increases the risk of injury.

### *Posture*

Posture is the position of the body, and depending on the nature of the task, different postures must be adopted. The ideal posture has the following characteristics:

- The appropriate muscles are used – larger muscle groups used for tasks requiring larger forces.
- The joints used are close to the middle of their range of motion.
- Supporting structures (ligaments, tendons, bones, etc.) are used in such a way as to handle maximum force.

It is best to use natural body positions to avoid injuries.

### *Grip*

When materials are handled manually, two types of grip are used: the *power grip* and the *pinch grip*.

### Power Grip

This type of grip is used for grasping, lifting, or moving an item 3cm or larger in diameter. Power grips include the *cylindrical* power grip, the *hook* power grip, and the *spherical* power grip.

### Pinch Grip

This type of grip is used for tasks requiring fine motor control or precision. Pinch grips include the *tip* pinch, the *chuck* pinch, and the *lateral* pinch. When such grip must be used for extended periods of time, the amount of force should be limited.

### *Temperature and Vibration*

Temperature extremes and vibration can also contribute to the development of MSDs.

### Temperature

Overly cold temperatures may cause the following problems:

- Loss of flexibility
- Reduced blood circulation
- Reduced sense of touch in the extremities

Overly hot temperatures may cause the following problems:

- Dehydration
- Decreased endurance and increased fatigue
- Distraction resulting in the use of improper postures

### Vibration

Body parts affected by vibration are those directly in contact with vibrating equipment. There are two types of vibration: *segmental* vibration and *whole-body* vibration.

Segmental vibration affects just one part of the body, the most common one being hand-arm vibration (from the use of tools like chain saws, chipping guns, etc.). Whole-body vibration affects the entire body, affecting individuals that work on vibrating floors or vehicles.

### *Multiple Risk Factors*

If a worker is exposed to more than one risk factor at a time, the overall risk may be increase by factors of 10 or more.

## Musculoskeletal Disorder – Manual Material Handling

Manual Material Handling (MMH) refers to the type of work that requires lifting, lowering, pushing, pulling, carrying, holding, or restraining in order to move or handle things.

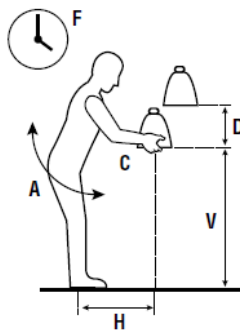
### *Lifting and Lowering*

The most common injury associated with these activities are back injuries. Contributing factors are the shape and weight of the object to be lifted, as well as the repetition or duration of the task.

Although a “load constant” (LC) of 23 kg (51 lbs) is considered safe to lift for 75% of women and 90 of men, the National Institute for Occupational Safety and Health (NIOSH) has developed a “revised NIOSH lifting equation” to determine the recommended weight limit based on particular circumstances.

To use this equation, the following information is required:

1. The horizontal distance (H) the load is lifted (distance of hands from midpoint between ankles – note, the feet can be together or apart),
2. The starting height of the hands from the ground, (vertical location, V),
3. The vertical distance of lifting (D),
4. The time between lifts or frequency of lifting (F),
5. The angle of the load in relation to the body (e.g., straight in front of you or off to the side, A), and
6. The quality of the grasp or handhold based on the type of handles available (hand-to-load coupling, C).



Each of these variables is then assigned a numerical value (multiplier factor) from the charts. The revised NIOSH lifting equation is as follows:

$$RWL = LC \times HM \times VM \times DM \times FM \times AM \times CM$$

where LC is the load constant (23 kg or 51 lbs) and other factors in the equation are:

- RWL, the “Recommended Weight Limit”,
- HM, the "Horizontal Multiplier" factor,
- VM, the "Vertical Multiplier" factor,
- DM, the "Distance Multiplier" factor,

- FM, the "Frequency Multiplier" factor,
- AM, the "Asymmetric Multiplier" factor, and
- CM, the "Coupling Multiplier" factor

When the movement is ideal, the multiplier factors will all equate to 1, which means that the frequency, type, or distance of movement will not limit the weight that can be safely lifted. This means that the recommended weight limit for lifting or lowering will be 23 kg (or about 51 pounds).

When the frequency, type or distance of movement is non-ideal the associated multiplier factor will be less than 1, causing the weight limit to be less than the ideal weight of 23 kg (or 51 lbs).

#### Using the Revised NIOSH Lifting Equation

Use the following tables to calculate each of the factors to use in the lifting equation above.

**Horizontal Multiplier (HM)**, refers to the horizontal distance the object is moved from the body.

H = Horizontal Distance (cm)	HM Multiplier
25 or less	1.00
30	0.83
40	0.63
50	0.50
60	0.42

**Vertical Multiplier (VM)** is the distance as measured at the starting point of the lift from the ground.

V = Starting Height (cm)	VM Multiplier
0	0.78
30	0.87
50	0.93
70	0.99
100	0.93
150	0.78
175	0.70
> 175	0.00

**Distance Multiplier (DM)** is the distance in centimetres the load travels up (or down) from the starting position.

<b>D = Lifting Distance (cm)</b>	<b>DM Multiplier</b>
25 or less	1.00
40	0.93
55	0.90
100	0.87
145	0.85
175	0.85
> 175	0.00

**Frequency Multiplier (FM)** is how often the lift is repeated within a certain time period.

<b>F = Time between lifts</b>	<b>FM Multiplier</b>			
	<b>Lifting While Standing</b>		<b>Lifting While Stooping</b>	
	<b>1 hr or less</b>	<b>Over 1 hr</b>	<b>1 hr or less</b>	<b>Over 1 hr</b>
5 min.	1.00	0.85	1.00	0.85
1 min.	0.94	0.75	0.94	0.75
30 sec.	0.91	0.65	0.91	0.65
15 sec.	0.84	0.45	0.84	0.45
10 sec.	0.75	0.27	0.75	0.27
6 sec.	0.45	0.13	0.45	-
5 sec.	0.37	-	0.37	-

**Asymmetric Multiplier (AM)** measures if the body must twist or turn during the lift.

<b>A = Angle in degrees</b>	<b>AM Multiplier</b>
900	0.71
600	0.81
450	0.86
300	0.9
00	1.00

**Coupling multiplier (CM)** determines the "coupling" or type of grasp the person has on the container. It rates the type of handles as *good* (handles), *fair* (make-shift cut outs in cardboard boxes) or *poor*. It is also necessary to know if the lifting is done in a standing or stooping position.

C = Grasp	CM Multiplier	
	Standing	Stooping
Good (handles)	1.00	1.00
Fair	1.00	0.95
Poor	0.90	0.90

**NOTE:** The revised NIOSH lifting equation does not apply when lifting/lower is done in the following situations:

- with one hand,
- for over 8 hours,
- while seated or kneeling,
- in a restricted workspace,
- objects that are unstable (buckets or containers of liquids),
- while pushing or pulling,
- with wheelbarrows or shovels,
- with high speed motion (faster than about 30 inches/second),
- extremely hot or cold objects or in extreme temperatures, or
- with poor foot/floor coupling (high risk of a slip or fall).

#### Using the Liberty Mutual MMH Tables

The Liberty Mutual Tables for MMH provide guidance on acceptable loads for lifting, lowering, and carrying activities. In most types of manual material handling tasks, load limits will be dependent upon job factors such as frequency, distance of lift, and the horizontal distance from the body – they are all accounted for in these tables.

To use these tables, the following information is required:

1. For lifting:
  - a. Frequency of the lift
  - b. The horizontal distance away from the body that the centre of gravity is during the lift
  - c. The vertical distance of the lift
2. For carrying:
  - a. Frequency of the carry

- b. Distance of the carry
  - c. Is the load carried with arms bent or straight
3. For pushing or pulling:

- a. Frequency of push
- b. Height of push point
- c. Push distance
- d. If the movement is an initial push, or a sustained push

#### Things to Do before Lifting

- Consider the size, shape, and weight of the load to determine if it can be safely lifted.
- Examine the load to see if it is secured to the floor or another structure.
- Examine the load to determine how it can be held, to minimize stress on the body.

#### Lifting Techniques

- Prepare for the lift by warming up the muscles.
- Stand close to the load and face the way you intend to move.
- Use a wide stance to gain balance.
- Be sure you have a good grip on the load.
- Keep arms straight.
- Tighten abdominal muscles.
- Tuck chin into the chest.
- Initiate the lift with body weight.
- Hold the load as close to the body as possible.
- Lift smoothly without jerking.
- Avoid twisting and side bending while lifting.

#### Pushing and Pulling

Pushing and pulling are used for a variety of activities, such as using manual carts and trucks, sliding objects, operating tools and controls, opening and closing doors, as well as wrapping objects.

The most common injuries include back injuries due to overexertion; slips, trips, and falls; finger and hand injuries due to being caught between or struck by an object; lower leg injuries due to bumping into or being caught between objects.

The factors that influence the movements needed for pushing and pulling are the following:

- body weight and strength
- height of force application
- direction of force application
- distance of force application from the body
- posture (bending forward or leaning backward)
- friction coefficient (amount of friction or grip between floors and shoes)
- duration and distance of push or pull

The tables below list the upper force limits for a variety of pushing and pulling tasks. They indicate the amount of force that a worker should exert.

**NOTE:** The forces in the tables are **not** the same as the weight of objects being pushed and pulled.

#### Recommended Upper Force Limits for Horizontal Pushing and Pulling

Condition	Force limits, in newtons (lbf, kgf)**	Examples of Activities
<b>A. Standing</b> 1. Whole body involved	225 N (50 lbf or 23 kgf)	Truck and cart handling. Moving equipment on wheels or casters. Sliding rolls on shafts.
2. Primary arm and shoulder muscles, arms fully extended	110 N (24 lbf or 11 kgf)	Leaning over an obstacle to move an object. Pushing an object at or above shoulder height.
<b>B. Kneeling</b>	188 N (42 lbf or 19 kgf)	Removing or replacing a component from equipment as in maintenance work. Handling in confined work areas such as tunnels or large conduits.
<b>C. Seated</b>	130 N (29 lbf or 13 kgf)	Operating a vertical lever, such as a floor shift on heavy equipment. Moving trays or a product on and off conveyors.

#### Recommended Upper Force Limits for Vertical Pushing and Pulling

Condition	Force limits, in newtons (lbf, kgf)**	Examples of Activities
<b>Pull down</b> Above head height	540 N (120 lbf or 55 kgf)	Activating a control, hook grip; such as a safety shower handle or manual control.
<b>Pull down</b> Shoulder level	200 N (45 lbf or 20 kgf)	Operating a chain hoist, power grips; less than 5 cm (2 in) diameter grip surface.
<b>Pull up</b> 25 cm above the floor	315 N (70 lbf or 32 kgf)	Stringing cable, threading up a paper machine, activating a control.
<b>Pull up</b> Elbow height	148 N (33 lbf or 15 kgf)	Raising a lid or access port.
<b>Pull up</b> Shoulder height	75 N (17 lbf or 7.5 kgf)	Raising a lid, palm up.
<b>Boost up</b> Shoulder height	200 N (45 lbf or 20 kgf)	Raising a corner or end of an object, like a pipe; boosting an object to a high shelf.
<b>Push down</b> Elbow height	290 N (64 lbf or 29 kgf)	Wrapping, packing, and sealing cases.



### Carrying and Holding

The ability to perform a carrying or holding task will depend on the posture used and the force required. The risk of injury increases if either of these factors is not ideal.

When items are being carried or held, the body is in a static posture. Various muscles exert force to maintain the item at height. The closer the item's centre of gravity (COG) is to the COG of the person, the lower the risk of injury.

Risk of injury increases with the increase of the distance between the two centres of gravities, due to a higher force being placed upon the structures that are exerting the hold.

### Using the Liberty Mutual MMH Tables

These tables provide guidance as to how much weight a person can carry comfortably, depending on their posture and the frequency of the task. These numbers are suitable for 75% of women and 90% of men.

#### Maximum weight that can be carried based upon frequency and carrying distance (with elbows bent)

Carrying		Carrying at about waist height (elbows bent)		
		Distance of lift Carry		
Frequency of lifts		2.1	4.3	8.5
1/8 h	1/8 h	21	21	19
1/30 min	2/1 h	16	16	14
1/5 min	12/1 h	16	16	14
1/2min	30/1 min	15	15	14
1/1 min	1/1 min	15	15	14
1/20 s	3/1 min	14	12	12
1/10 s	6/1 min	13	11	Out of Range

#### Maximum weight that can be carried based upon frequency and carrying distance (with elbows straight)

Carrying		Carrying at about waist height (elbows straight)		
		Distance of lift Carry		
Frequency of lifts		2.1	4.3	8.5
1/8 h	1/8 h	25	23	23
1/30 min	2/1 h	19	17	17
1/5 min	12/1 h	19	17	17
1/2min	30/1 min	18	16	16
1/1 min	1/1 min	18	16	16
1/20 s	3/1 min	17	13	14
1/10 s	6/1 min	16	11	Out of Range

## Musculoskeletal Disorder – Control and Reduction

Injuries can be prevented by considering job and workplace design, identifying and assessing risks, and placing the appropriate controls.

### *Job Design vs Workplace Design*

Job design refers to administrative controls that can help improve working conditions. Workplace design concentrates on the planning and creation of a workstation, equipment, and tools that can decrease the physical demands placed upon a worker.

### *Job Design*

A good job design will make use of administrative controls to organize the work. The following techniques can be used to optimize job design:

- *job rotation* – distributing a group of jobs or tasks among a number of employees. Job variety, which results from job rotation, allows for the relief of physical demands by providing work breaks from repetitive tasks. An added benefit is a cross-trained workforce.
- *job enlargement* – increasing the number of tasks that are performed by a worker, without necessarily increasing their level or responsibility. Besides providing physical relief, it also adds interest.
- *task/machine pacing* – rapid machine or process paces may force workers to use highly repetitive movements. The problem can become more serious if the worker is having trouble meeting those requirements, which can lead to forceful movements.
- *rest/work breaks* – such breaks alleviate the problems of unavoidable repetitive movements or static body positions. It might be preferable to take more frequent but shorter breaks ("micro breaks").

During rest breaks, employees should be encouraged to change body position and to exercise to stretch and use different muscle groups. If the employee has been very active, a rest break should include a stationary activity or stretching.

- *use of teams* – this can minimize physical demands on employees, since task can be distributed.

### *Workplace Design*

A good workplace design reduces awkward or static positions, repetitive motions and the need to use forceful movements. Each of its components – work surfaces, material flow/storage, mechanical aids, and tools – must be designed appropriately.

### *Work Surfaces*

Work surface heights should be adjustable to best suit the height of the worker and the task being performed.

*Seated work surface heights* depend on the nature of the task. In a seated position, tasks such as writing and light assembly can be performed comfortably at or close to elbow height. If the work task involves fine detail (soldering electrical components, or assembly of fine parts), the work surface height should be adjusted based on the worker's visual needs.

*For standing workstations*, a reference height of a worker's resting elbow position should be used. The actual working height can then be adjusted according to the type of task being performed.

Work tasks can be categorized into three main groups:

- *Precision type tasks* – tasks that require fine manual manipulation and/or requires high visibility of the work piece or work task. Normally only small exertions of force are required. Typically, the work surface is raised approximate 5 cm above elbow height.
- *Light duty tasks* – activities that require neither high visibility nor the use of fine movements or manipulation. Work surfaces for these types of tasks are ideally placed between 5 cm and 10 cm below elbow height. Elbow rests are optional to the worker and can be used to provide more comfort for the worker.
- *Heavy duty tasks* – tasks that involve the use of high exertions of force (chipping, drilling, or grinding).

#### *Things to Consider When Determining Work Surface Height*

There are three important criteria to keep in mind when determining the height of the work surface:

1. It will probably be used by multiple workers of different heights.
2. Jobs often consist of multiple tasks, each with its own force and visual requirements
3. All the tasks for one job are performed on one workstation.

#### *Materials Flow*

An effective material flow system will minimize the physical demands of workers by reducing the frequency an item needs to be handled.

#### *Mechanical Aids*

Mechanical aids decrease the physical demands on a person by removing awkward postures and eliminating lifting, lowering, carrying, and holding type activities.

*Hand trucks (dollies)* – it is essential to make sure to match their weight capacity with the load being handled. Some hand trucks are specifically designed for stair use.

*Platform trucks* – these can be used to transport irregularly shaped items. The orientation of wheels should be chosen based upon what item is being moved and how it will be moved.

*Semi-live skids* – these are skids with two wheels at one end, and two support legs at the other end. They can be used for short-term storage, and are moved by using a detachable jack.

*Storage bins and racks* – these can be mounted onto semi-live skids or platform trucks.

*Pallet trucks* – these are designed to move materials on wooden pallets.

*Dump trucks* – these are used for removing materials in bulk. They can be easily tilted to load and remove most of the material from them, when required.

*Drum trucks* – these are hand trucks designed for transporting large drums.

*A-frame trucks* – these are designed for handling long sheets of materials.

*Lifting and lowering hand trucks* – these are for use in storage and loading areas.

*Pulleys* – these are used to help hoist items. The number and diameter of pulleys used will determine how much force is required to perform the lift.

*Mounted pulleys* – pulleys can be mounted on portable frames to help lift large items.

*Portable cranes* – these allow for the lifting of large heavy items from the floor.

*Lift tables* – these are used to lift and lower large loads. They can be used to lift pallets of materials to a level where an operator can more easily handle the load without having to use awkward postures.

*Lift tables with rollers* – such combinations are used for moving materials horizontally and vertically.

*Box-tilters* – these raise and tilt materials towards workers, which reduces or even eliminates bending and reaching.

*Jigs and vices* – combined with a tool balancer, they eliminate bending and reaching, while reducing force requirements.

## Tools

Hand tool design has a great impact on how efficiently and safely it can be used. The strength required to hold the tool depends on the grip configuration, while the wrist posture is essential in determining how much strength can be imparted on the tool and what the risk of injury is while using it.

### *Tool Handles*

Hand tool grips should be designed to minimize wrist deviation. Handles should allow the forearm and hand to be aligned, which will provide the greatest development of force with minimal risk of injury.

#### Bent vs straight handles

Whether a handle should be bent or not depends on the operation being performed.

Tools with "bent" (angled) handles or tools with pistol-grips are preferred where the force is exerted in a straight line in the same direction as the straightened forearm and wrist, especially when the force must be applied horizontally.

Tools with straight handles are for tasks where the force is exerted perpendicular to the straightened forearm and wrist.

#### Made for power grip

Tools handles should be designed to accommodate a power grip (with the exception of precision tasks). Handles should be cylindrical or oval in cross section, with a diameter of between 30 mm and 45 mm (between 5 mm and 12 mm for precision work; between 50 mm and 60 mm for a greater torque on large screwdrivers).

Slightly contoured or flared handles with padding can increase comfort, reduce the amount of force required, and reduce the risk of slippage in sweaty hands.

### *Tool Weight*

Tools must be of appropriate weight: those used for grinding or pounding need to be heavy, to reduce the amount of force operators need to use. However, tools that are too heavy will fatigue workers.

Ideally, a worker should be able to operate a tool with one hand, so its weight should not exceed 1 kg (2.2 lb.). If a tool is too heavy to carry in one hand without strain, it should have two handles – one to carry the weight, and one to control its motion.

### Tool Design Guidelines

Description	Guideline	Reason
Tool Shape	Slightly contoured	Easy grip
Direction of force is in-line with forearm and wrist	Bent Handle	Minimal wrist deviation
Direction of force is perpendicular to forearm and wrist	Straight Handle	Minimal wrist deviation
Grip handles (two handles)	50 – 65 mm (separation distance)	Fits both men and women with maximum grip strength
Handle Length	100 – 130 mm	Keep contact out of palm
Handle Diameter (power grip)	30 – 45 mm	Greater force and stability
Handle Diameter (precision task)	5 – 12 mm	Greater control
Tool Weight (< 1 kg)	One handle	1 hand use
Tool Weight (> 1 kg)	two handles or tool balancer	2 hand use

### *Identification and Assessment*

A Physical Demands Analysis (PDA) is a tool that can be used to determine the compatibility between a worker and a specific job. It evaluates the various risk factors of a given task and indicate which parts of the body are at risk for developing an MSD while performing that task.

## A PDA Recording Form

Task Number:			Percent of Shift:			
Task Description:						
MMH Activities	Body Part	Posture Criteria	Posture Score	Freq. Score	Mass Score	Risk Score
Check only 1 box. Fill out one table for each MMH activity used in a task.  <input type="checkbox"/> Lifting / Lowering  <input type="checkbox"/> Pushing / Pulling  <input type="checkbox"/> Carrying  <input type="checkbox"/> Finger Manipulation or typing  <input type="checkbox"/> Other activities	Neck	Forward/Backward Bend				
		Twist				
		Total Neck Score				
	Back	Forward/Backward Bend				
		Twisting				
		Lateral Bend				
		Total Back Score				
	Shoulder	Flexion				
		Abduction				
		Extension				
		Total Shoulder Score				
	Lower Arm	Flexion (Elbow bent)				
		Rotation (outside or across body.				
		Total Lower Arm Score				
	Wrist	Forward/Backward bend				
		Ulnar/Radial Deviation				
		Pronation/Supination				
		Total Wrist Score				
	Grip	Pinch				
		Power				
Mousing/Typing						
Total Grip Score						
Check which lower body movement is required: <input type="checkbox"/> Sitting <input type="checkbox"/> Standing <input type="checkbox"/> Walking <input type="checkbox"/> Kneeling/Crouching <input type="checkbox"/> Lying General Comments about the Manual Materials Handling activity:						

## A Sample PDA

Job Title: <i>Shipper/Receiver</i>	Date of Assessment:
Department: <i>Materials</i>	Job Photo
Work Hours: <i>9 am - 5 pm</i>	
Breaks: <i>2 x 15 min., 1 x 30 min.</i>	
Special Training: <i>Lift truck, propane handling, computer use, scanner use.</i>	
Purpose and Nature of Job:	
1. <i>Receive raw materials</i> 2. <i>Inventory of raw materials</i> 3. <i>Ship out finished products</i>	
List Essential Tasks of Job (Number each task):	
1. <i>Operate computer (20% of shift)</i> 2. <i>Scanner use (20% of shift)</i> a. <i>Scan bar codes (50% of scanner use = 10% of total shift)</i> b. <i>Program scanner (50% of scanner use = 10% of total shift)</i> 3. <i>Operate Lift truck (35 % of shift)</i> 4. <i>Moving boxes manually (10% of shift)</i>	
List Non-Essential Tasks of Job (Number each task):	
5. <i>Sweep (5% of shift)</i> 6. <i>Clean spills (5% of shift)</i> 7. <i>Empty garbage (5% of shift)</i>	
Hand Tools Used (List appropriate weight): <i>Barcode scanner - 2 lbs</i>	List Equipment Used: <i>Lift truck</i> <i>Compressed gas cylinder dolly</i>
PPE required: <i>Safety shoes</i> <i>Gloves</i>	Other Information: <i>N/A</i>

## Controls

To implement MSD hazard controls, the following steps should be taken:

### 1. Prioritize hazards:

When the hazards of the essential tasks for a given job are assessed, their risk ratings are listed.

Steps must be taken to minimize risks of tasks starting with the highest rating.

### A Sample Risk Prioritizing Table

Task #	Task Name	Activity	Body part(s)	Score
4	Manually handling boxes	Carrying	Lower arm	80
4	Manually handling boxes	Carrying	Neck, shoulder, grip, back	60
1	Computer Operation	Typing	Wrist	60
3a	Lift truck operation	Other	Neck, Back	56

### 2. Determine the root cause of the hazard:

When such a cause is eliminated, the risk will be eliminated as well. There are five categories of root causes:

1. *Process* – the structure of the work performed. The following questions should be answered:

- Is the length of time appropriate for the task, or do the workers have to rush to get things done?
- Are tasks being paced by machines?
- How long is each task being performed?
- Do production and quality standards impact how the employee works?
- Are there bottlenecks in the process?

2. *Equipment* – this also includes tools required for the job. The following questions should be answered:

- Is the working height of the workstation appropriate and adjustable?
- Is handheld equipment heavy?
- Are controls and displays at a location that allows the worker to view them without disrupting their workflow or using awkward postures?
- Are there excessive mobility or force requirements associated with the use of the equipment (palm sanders require grip and movement of hands)?
- Is the equipment difficult to maintain?

3. *Materials* – both items being moved or worked on. Their weight, shape, size, and the presence or absence of handholds are important factors. The following questions should be answered:

- Does the work piece require a pinch grip – but it is over 5 lbs?
- Is the item easy to hold?
- What position is used when holding or lifting the item?
- Does the shape or size of the item force the worker moving the item to use a poor posture?
- Is the item heavy?

4. *Environment* – workers' surroundings and their conditions (temperature, lighting, space, and housekeeping). The following questions should be answered:

- Does the worker have to immerse their hands in cold water?
- Is the worker in contact with cold surfaces, such as metal?
- Is the worker in close proximity to hot surfaces, such as metal?
- Is the worker performing tasks with moving equipment in an area full of shadows?
- Can the workstation be re-organized to minimize the presence of shadows?

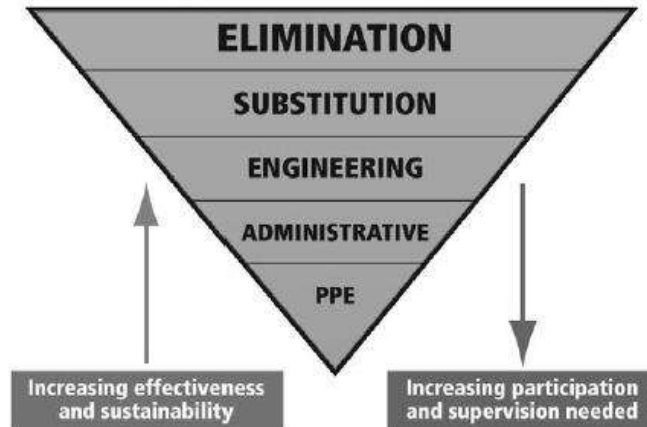
5. *Human* – training, experience, and supervision. The following questions should be answered:

- Are the workers competent for their positions?
- Are the workers supervised by competent supervisors/managers?
- Are employees working excessively, or do they appear excessively fatigued while performing their job duties?
- Is sufficient training provided to the worker to ensure their safety?
- Are employees using incorrect or different techniques?
- Are employees using personal protective equipment (PPE), equipment and tools correctly?

### **3. Choose control options:**

Controls should be chosen as appropriate for a given situation, keeping the main goal in mind: achieve the highest worker efficiency while minimizing his/her risks of getting injured or developing an occupational illness. The preferred method is to use the *hierarchy of controls model*.





The hierarchy of controls model suggests that controls which directly alter the hazard to reduce risk are far more effective than those relying on human participation.

#### Elimination

Elimination is the process of removing the hazard from the workplace. This is the most effective control.

#### Substitution

This method is applicable for processes utilizing hazardous chemicals or materials which can be substituted with less harmful substances.

#### Engineering Controls

Such controls involve the design and redesign of job tasks through the use of the following three principles:

1. Alter how materials, products, and parts are transported throughout the process,
2. Alter the workstation layout to suit the process being performed, and,
3. Alter the way parts, tools, and materials are manipulated.

#### Administrative Controls

These controls limit workers' exposures by scheduling shorter work times in hazardous areas or by implementing other strategies. These are some of the admin control methods:

- Scheduling maintenance and other high exposure operations for times when few workers are present (evenings, weekends).
- Using job-rotation schedules that limit the amount of time an individual worker is exposed to a hazard.
- Using a work-rest schedule that limits the length of time a worker is exposed to a hazard.
- Safe work practices and safe job procedures.

#### PPE

PPE may include a piece of clothing (gloves or chemically resistant suits) or equipment (respirators) that provide a physical barrier between the hazard and the worker.

**NOTE:** Items like back belts and wrist supports should not be considered personal protective equipment because there is no conclusive evidence supporting that they actually reduce the risk of injury.

**4. Implement a control plan:**

A control plan must be chosen based on the hierarchy of controls and the risk ratings.

## Occupational Health & Safety Procedures: Handling and Storage of Hazardous Materials

### Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)

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#### **Intent**

Joint Seal Waterproofing values the safety and wellbeing of our workers, and will train them on the proper handling and storage of hazardous materials to ensure proper procedures are being followed for everyone's safety. Each work will take WHMIS 2015 training which incorporates elements of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

#### **Definitions**

GHS: Globally Harmonized System of Classification and Labelling of Chemicals.

MSDS: Safety Data Sheet.

#### **Guidelines**

WHMIS 2015 includes the new harmonized criteria for hazard classification and establishes the requirements for labels and safety data sheets (MSDSs).

Joint Seal Waterproofing will ensure that:

- The company is up to date on all WHMIS 2015 changes and any applicable transitional timelines.
- All legislative standards are met.
- All employees receive information and training on hazardous materials and the safe use of hazardous products in the workplace (see the section below on the training and education program).
- All containers holding hazardous materials have appropriate labels.
- MSDSs are up to date, accessible, and contain additional hazard and precautionary information.
- All workplace hazardous materials include supplier labels.
- Suppliers provide the appropriate supplier labels and MSDSs.
- Control measures are in place to protect the health and safety of workers.

#### **Training and Education Program**

Joint Seal Waterproofing shall provide appropriate WHMIS 2015 training and education for all workers and managers who are exposed or likely to be exposed to hazardous materials while performing their regular job duties.

Joint Seal Waterproofing shall consult the Health and Safety Representative to ensure the appropriateness of the training and education materials and programs.

The worker training and education program shall include information on the following:

- Supplier label
- Hazard symbols and pictograms
- Safety data sheets (MSDSs)
- Hazard groups
- Hazard classes
- Hazard categories
- Hazard statements
- Signal words
- Procedures for the safe use, storage, handling, and disposal of hazardous materials in the workplace; handling leaks and spills; an emergency event involving hazardous products; and worksite-specific training on measures for working safely with hazardous products.

Joint Seal Waterproofing will review its training program and content annually, and revise as necessary. Should there be any changes, workers will be retrained.

Joint Seal Waterproofing workers will be compensated for time spent at training sessions, which is considered to be normal work time, and paid at their regular rate of pay, as applicable.

Joint Seal Waterproofing will respect the right of workers to be consulted regarding the development and implementation of the instruction and training, and will open the discussion process to suggestions in a consultation period. Workers will have an opportunity to comment on:

- The content of the program
- The amount of training
- Who is to receive what kind of training
- Who will deliver the training program

### **Worker Responsibilities**

Workers must do the following:

- Participate in WHMIS 2015 training
- Report any violation of safe work procedures connected to WHMIS 2015 to their immediate supervisor or Health and Safety Representative
- Inform their immediate supervisor or Health and Safety Representative if they do not have the proper information on a hazardous product (if the MSDS is missing, damaged, or illegible).

### **Supplier Responsibilities**

Suppliers must do the following:

- Identify whether their products are hazardous products
- Prepare labels and MSDSs to provide to purchasers of hazardous products intended for use in a workplace

## Workplace Hazardous Materials Information System (WHMIS) General Checklist

This checklist is designed to ensure compliance with Workplace Hazardous Materials Information System (WHMIS) legislation.

Requirement	Completed	Requires Attention	Documentation and Training Course	Notes
Create and implement a WHMIS policy			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	
Identify hazardous materials in the workplace			Risk and Hazard Assessment Policy Hazard Assessment Form	
Identify all workers required to receive WHMIS training			Notice to Staff Regarding WHMIS Training Requirement Chemical Orientation Checklist	
Provide WHMIS training to required staff			WHMIS 2015 including the GHS for Workers and Supervisors - All Jurisdictions	
Training provided on safe handling and storage			WHMIS 2015 including the GHS for Workers and Supervisors - All Jurisdictions Chemical Orientation Checklist	
MSDSs meet all requirements (label contents, symbols, placement, etc.)			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	
Process in place to update MSDSs			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	
H&S Representative has copies of MSDSs			Joint Health and Safety Committee Members List	
Assess and classify all biological and chemical agents produced on-site for own use to determine hazardous products			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	
Provide written assessment of on-site products to JHSC or health and safety representative and employees for review			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	

Ensure hazardous products from a supplier contain supplier labels			Employee Training Record Form	
Hazardous waste is adequately stored and properly identified			Health and Safety Management Review Policy	
Post proper label information for hazardous materials not in a container			Workplace Hazardous Materials Information System (WHMIS) 2015 Compliance Policy (GHS)	

### Safety Data Sheet (MSDS) File System Management Policy

The safety data sheet (MSDS) Administrator is responsible for compiling, maintaining, and filing MSDSs for hazardous chemicals used or stored in work areas where employees may be exposed to such chemicals.

The supervisor of each operational area will ensure that all employees under his or her supervision have access to the MSDSs for the chemicals used in their work areas.

#### **MSDS System Management**

MSDSs received with shipments of hazardous chemicals will be forwarded to the MSDS Administrator, who will check the MSDSs for blank spaces or obvious inaccuracies.

IMPORTANT: If there is no relevant data for a section or subheading within an MSDS, it may NOT be left blank – it must be marked to indicate that no applicable information exists.

#### **Procedure to follow when handling MSDSs**

- A copy of any MSDSs with blank spaces or inaccuracies will be returned to the hazardous chemical supplier noting the deficiencies.
- MSDSs will be provided by the manufacturer, importer, or distributor in English. If appropriate, the MSDS Administrator may opt to maintain copies of MSDSs in other languages, as well as English.
- Each new or updated MSDS received at the facility will be filed or downloaded into the MSDS database.
- Duplicate MSDSs for the same chemical will be removed, and the most up-to-date MSDS retained.
- A missing MSDS for a hazardous chemical will be requested from the supplier as soon as possible after the omission is discovered.
- No hazardous chemical will be used in any work area unless it is either accompanied with the MSDS for the chemical or it is verified that there is an MSDS on file.
- No new hazardous chemical will be introduced into a work area unless there is an MSDS on file for it.

#### **Content and format of MSDSs.**

The following list describes the 16 section headings that must be displayed in chronological order on any MSDS received from a supplier:

1. Chemical product and company identification
2. Hazard identification
3. Composition and information on ingredients
4. First-aid measures

5. Firefighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls—personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

**MMSDS access system.**

The primary MMSDS file management system is available in print. If the primary system becomes inoperable, the backup system is electronic filing.

The MSDS system manager will periodically test and record the results of the primary and backup MSDS access systems.

**Employee Access to MSDSs**

Employees will be trained on how to access and read MSDSs. Employees will not need special authorization or permission to access MSDSs.

**MSDS Access at Multiple or Mobile Worksites**

MSDSs will be kept at the warehouse where all the materials are stored, and also in the folders in each company vehicle so they can be readily accessible, as needed.

**MSDS Records**

An MSDS for each hazardous chemical will be kept in the MSDS file or database system for as long as the hazardous chemical is used in any work areas.



## Material Handling and Storage

Supervisors will ensure that safe material-handling techniques are used by their employees. They will use the following checklist during their regular inspections:

### CHECKLIST

- ( ) Aisles and doorways provide safe clearance for equipment.
- ( ) Aisles are permanently marked and kept clear.
- ( ) All mechanized equipment is inspected daily and prior to use by the operator.
- ( ) Dock boards [**or bridge plates**] are used when loading or unloading operations take place between vehicles and docks.
- ( ) Rear wheels of tractor trucks and trailers are chocked to prevent movement during loading and unloading operations.
- ( ) Dock plates and loading ramps are secured and in good condition to withstand loads.
- ( ) Hand trucks are maintained in good working condition.
- ( ) Chutes are equipped with sideboards to prevent material from falling off.
- ( ) Chutes and roller sections are firmly secured and contain working brakes at the delivery end.
- ( ) Pallets are inspected before being loaded or moved.
- ( ) Material is stored in secure [**bundles, containers, bags, etc.**] that are stacked, interlocked, and limited in height to guard against sliding or collapse.
- ( ) Storage areas are kept neat and clean to prevent hazards from tripping, fire, explosion, or pests.
- ( ) Open pits, tanks, vats, or ditches are covered or standard guardrails are used to protect employees from falling in.
- ( ) Electric hoists and cranes conform to all industry standards.
- ( ) Electric hoists and cranes will be used only to transport the rated load size.
- ( ) Chains and rope slings are examined before each use by the operator to determine any defects.
- ( ) All employees inform their supervisors of defects in hoisting equipment, and the supervisors tag the equipment and remove it from use.
- ( ) Before any lifting is done, the operator makes sure no one is standing under the load.
- ( ) Only trained employees are permitted to operate the hoisting equipment.



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## First Aid

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## First Aid

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a procedure on the provision and maintenance of first aid, should a need arise, following *First Aid Regulation 1101*. Over half of our employees have been certified in First Aid, and First Aid kits are available at the office, in the warehouse, and in each company vehicle. One is always available at each jobsite. Copies of First Aid certificates are available with each kit. Since these certificates are valid for three years, we keep track of which First Aider needs re-certification and when. To ensure that our First Aid kits are in optimal conditions, they are inspected on a monthly basis.

### First Aid Response Procedure

All employees have been trained on reporting all injuries to their immediate supervisor. Should any injury occur, First Aid is administered, and the corresponding form is filled out by the supervisor (this record is kept on file). The records include a description of the circumstances and the nature of the injury, witness' names, as well as first aid treatment administered. Should there be a need for further medical assistance, any employee will know what number to call – “In Case of Injury” poster is available with each First Aid kit.

### Formats

The sections below outline First Aid requirements, procedures, responsibilities, and transportation. The injury record form, as well as First Aid log sheet and checklist are also available.

Safety is everyone's responsibility, and having personnel certified in First Aid and the corresponding kits available at each site is one of the key components to achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## First Aid Requirements

The employer is required to have:

- Posted first aid certificates,
- At a minimum 1 first aider per shift must be available and a first aid trained designated backup,
- First aid equipment has to be available and accessible

Size of workplace – per shift training level requirement:

less than 5 workers	Emergency First Aid
more than 5 but less than 15	Standard First Aid
more than 15 but less than 200	Standard First Aid
more than 200	Standard First Aid

First Aid Kit Requirements:

less than 5 workers	Section 8
more than 5 but less than 15	Section 9
more than 15 but less than 200	Section 10
more than 200	Section 11
First Aid station – less than 200	Section 9, 10
First Aid room – more than 200	Section 11

## Resources

Under the WSIA there are first aid requirements (Regulation 1101) for every workplace. The regulation requires that:

- There be at least one person trained, at the designated level, on every shift.
- That the 'designated' first aider be available to render assistance at all times during that shift.
- A copy of Form 82 – poster be posted in the workplace, where all workers can see it.
- Injuries must be reported to the WSIB using Form 7.

Availability of First Aid Kits	Located within quick and easy access for all employees.
Required Components in the First Aid Kits	Each first aid kit must be adequately stocked with supplies (as per Reg. 1101).
Number of Trained/Qualified First Aiders	Must be a qualified first aider on every shift.
First Aid attendant works in the immediate vicinity of the first aid kit	Must work in close proximity to the first aid station/ kit.
First aid treatment/advice recorded	<p>The first aid attendant records in a treatment/ advice logbook all circumstances surrounding the incident as described by the injured employee.</p> <p>Treatment record includes (see sample form):</p> <ul style="list-style-type: none"> <li>▪ Date of injury</li> <li>▪ Time of injury</li> <li>▪ Name(s) of witnesses</li> <li>▪ Nature</li> <li>▪ Exact location of treatment given</li> </ul> <p>Each first aid station has its own treatment/ record logbook.</p>
First Aid Certificates Posted	The first aid certificates of qualified first aid attendant(s) on duty is/are posted.
First Aid Kit Inspection Record	<ul style="list-style-type: none"> <li>▪ Establish an inspection schedule.</li> <li>▪ Assign responsibility for inspections.</li> <li>▪ A recording system should include the date of the most recent inspection of the first aid box and signature of the inspector.</li> </ul>
Stretcher and Blanket(s) Compliance	<p>Every employer employing more than fifteen (15) and less than 200 workers in any one shift at a place of employment shall provide and maintain at least:</p> <ul style="list-style-type: none"> <li>▪ One stretcher and</li> <li>▪ Two blankets</li> </ul>
First Aid Room Compliance	Every employer employing more than 200 workers in any one shift at a place of employment must supply and maintain a first aid room.

## First Aid Procedures

1. The supervisor shall ensure compliance with all applicable Health and Safety Legislation and Workers Compensation or Insurance Board requirements regarding first aid in all workplaces under their supervision.
2. Should an injury occur, it is essential that first aid be administered immediately, followed by proper medical treatment if necessary.
3. A first aid kit with the required contents will be available at each workplace.
4. There will be a certified first aider available at each workplace.
5. There will be a certified first aider available on each shift.
6. The first aider will ensure that an injury treatment record has been completed.
7. Transportation of an injured worker to a hospital, doctor's office or worker's home will be provided by a supervisor when necessary.

## First Aid Responsibilities

Medical/First Aid Responsibilities	
Safety staff	Provide resources and set up medical/first aid facilities to comply with Workplace Safety and Insurance Act and First Aid Regs.
Safety coordinator	Ensure that designated employees have completed first aid training and possess current certificates and that their names are known and posted in the superintendent's office and first aid station.
Safety staff	Monitor the first aid station and post details of trained first aid personnel on site.
Safety staff, Supervision, Trained workers	When an accident occurs, the first trained person on location will administer first aid. This trained person will then have someone notify the supervisor, and the health and safety representative.
Safety staff	Assess the severity of the injury and ensure that protection has been provided against continuing or further hazards.
Safety staff, Trained workers	A person trained in first aid will stay with the injured person until help arrives, and will inform medical personnel of first aid treatment given.
Supervision,	Record first aid treatment or advice given to the injured person.
Supervision	Provide immediate transportation to a hospital, doctor's office, or the worker's home, if emergency vehicle transportation is not available.
<b>Resources Needed:</b> <ol style="list-style-type: none"> <li>1. Personnel trained in first aid</li> <li>2. First aid equipment and supplies</li> <li>3. First aid station</li> <li>4. MSDS binder.</li> </ol>	
<b>Notes:</b>	

## First Aid Transportation

<b>Title:</b>		<b>Date of Issue:</b>	
<b>Approved by:</b>		<b>Review/Revise Date:</b>	
<b>Location:</b>			
<p>The company will provide transportation to the hospital, doctor's office or worker's home, when necessary, following an injury or illness.</p> <p>The preferred method of transportation, if required, is an ambulance.</p> <p>Should this method of transportation not be appropriate, then the company will call for a taxi. The injured worker will be accompanied by first aid attendant or designate.</p> <p>Should the employee refuse the transportation, the company will attempt to:</p> <ol style="list-style-type: none"> <li>1. Identify any other transportation methods that the worker would prefer.</li> <li>2. Reiterate the importance of accepting the transportation to the hospital, doctor's office or worker's home.</li> <li>3. Call 911 and get the ambulance attendant to administer medical attention on site.</li> <li>4. The worker will not be allowed to continue work until medical clearance is provided.</li> </ol> <p>Responsibilities of the individual travelling with the injured worker:</p> <ol style="list-style-type: none"> <li>1. Continue to administer first aid, if required.</li> <li>2. Ensure an injury package is taken, containing the Functional Abilities Form and Material Safety Data Sheet (if necessary), to the medical facility.</li> <li>3. Maintain contact with the company providing updates when the worker has reached their destination.</li> <li>4. Return to the company to provide additional follow-up and complete the injury/incident documentation.</li> <li>5. Additional duties may be added based on each individual circumstance.</li> </ol>			
<b>Approval Signature:</b>		<b>Document to be posted:</b> No	
<b>Distribution to:</b>	all facilities, Senior Management, H&S Rep		
<b>Important Reminder:</b>			
Your company must designate who accompanies the injured worker.			



## First Aid Checklist

Here is the First Aid Checklist, as applicable to an organization of our size, per WSIB Regulation 1101 Requirements.

# of Workers on Site	General Contractor Responsibilities	First Aid Kit Requirements	<input checked="" type="checkbox"/> or <input checked="" type="checkbox"/>
1 - 5	Provide and maintain a first aid station with a first aid box.  Ensure that the first aid station is at all times in the charge of a worker who, <ul style="list-style-type: none"> <li>Has a valid emergency first aid certificate and</li> <li>Works in the immediate vicinity of the station.</li> </ul>	A current First Aid manual	<input type="checkbox"/>
		1 card of safety pins	<input type="checkbox"/>
		12 adhesive dressings individually wrapped	<input type="checkbox"/>
		4 sterile 3" square gauze pads	<input type="checkbox"/>
		2 rolls of 2" gauze bandage	<input type="checkbox"/>
		2 field dressings, 4" square or 2x4"	<input type="checkbox"/>
		1 triangular bandage	<input type="checkbox"/>
5 - 15	Provide and maintain a first aid station with a first aid box.  Ensure that the first aid station is at all times in the charge of a worker who, <ul style="list-style-type: none"> <li>Has a valid emergency first aid certificate and</li> <li>Works in the immediate vicinity of the station.</li> </ul>	A current First Aid manual	<input type="checkbox"/>
		1 card of safety pins	<input type="checkbox"/>
		24 adhesive dressings individually wrapped	<input type="checkbox"/>
		12 sterile 3" square gauze pads	<input type="checkbox"/>
		4 rolls of 2" gauze bandage	<input type="checkbox"/>
		4 rolls of 4" gauze bandage	<input type="checkbox"/>
		4 sterile surgical pads suitable for pressure dressings	<input type="checkbox"/>
		6 triangular bandages	<input type="checkbox"/>
		2 rolls of splint padding	<input type="checkbox"/>
		1 roll-up splint	<input type="checkbox"/>

## First Aid Log Sheet

This form must be completed by the First Aider or designate and kept available.

<b>Name of Injured Person</b>	
<b>Date of Injury (D/M/Y)</b>	
<b>Time of Injury</b>	
<b>Name of Witness(es)</b>	
<b>Nature/Location of Treatment</b>	
<b>Name of First Aider</b>	

<b>Name of Injured Person</b>	
<b>Date of Injury (D/M/Y)</b>	
<b>Time of Injury</b>	
<b>Name of Witness(es)</b>	
<b>Nature/Location of Treatment</b>	
<b>Name of First Aider</b>	

<b>Name of Injured Person</b>	
<b>Date of Injury (D/M/Y)</b>	
<b>Time of Injury</b>	
<b>Name of Witness(es)</b>	
<b>Nature/Location of Treatment</b>	
<b>Name of First Aider</b>	

The Health and Safety Representative will collect the first aid logs each month.

Injury Record Form

Date	Time of Accident	Time/Date Reported	Name	Occupation	Description of Accident	Nature of Injury	Treatment(s)	FAA Initials	Deposition of Case & Remarks





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# Health and Safety Representative

2<sup>nd</sup> Edition

Effective Date:	Jan. 2020		Approved By:	Boris Gopka, Executive Director
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## Health and Safety Representative

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

### Legislation

As required by the legislation (OHSA S.8) for a company our size, a Health and Safety Representative (H&S Rep) was selected by workers.

### H&S Rep Summary of Duties

The purpose of the Health & Safety Representative is to act as an advisory resource to promote a safe work environment for all employees. The representative shall be an auditor of the overall health and safety system.

The representative travels from jobsite to jobsites daily and can be reached via cell phone when not present at a given site.

As part of his or her duties, the H&S Rep carries out monthly inspections of the office, the warehouse and each active jobsite and fills out the corresponding report. If the H&S Rep needs to extend recommendations upon completing the inspection, they are forwarded to management in a corresponding format (see below). Management will then respond, defining any corrective actions and establishing a Corrective Action Plan (CAP), as needed.

### Roles and Responsibilities

#### Employer

Employer responsibilities with respect to the Health & Safety Representative are:

- Upon request, provide information regarding the identification of potential or existing hazards involving materials, processes or equipment
- Provide a copy of all orders or reports issued by a MOL Inspector
- Provide the H&S Rep with an opportunity to accompany a MOL inspector on the physical inspection of our workplace
- Provide the H&S Rep with information and assistance as required for the purpose of inspecting our workplace
- Provide information as required under any applicable designated substance regulation

- Advise the HSR of the results of the assessment or reassessment of the workplace violence and harassment risks, and provide a copy of the assessment if in writing
- Provide any other specific information where prescribed
- Provide the HSR with the time necessary to carry out monthly workplace inspections, attend work refusals, and investigate workplace accidents involving critical injuries or fatalities
- Ensure the HSR is paid at either their regular rate, or where applicable, their premium rate of pay when absent from work for the purpose of carrying out their duties under the Act

It is an offence to knowingly hinder, interfere, or give false information to the HSR when in the process of exercising his or her powers or performing his or her duties under the Act.

### Health & Safety Representative

The responsibilities and powers of the Health & Safety Representative include:

- Supporting and reinforcing the Internal Responsibility System (IRS)
- Identifying, evaluating and recommending strategies to prevent or resolve health and safety concerns
- Providing ongoing dialogue between management and employees on health and safety issues
- Performing all functions in a manner that respects confidentiality of workplace parties and/or issues
- Assisting with and supporting the integration of health and safety into our business practices
- Ensuring the responsible/appropriate manager follows up on identified hazards
- Inspecting the workplace at least once a month and documenting findings
- Being consulted and present at the beginning of health and safety related testing (i.e. industrial hygiene testing)
- Making formal recommendations to senior management about health and safety in the workplace
- Promoting best practices in health and safety management
- Identifying trends that will proactively address emerging health and safety issues
- Participating in the first and second stage investigation of work refusals
- Inspecting our workplace if there are critical injuries or fatalities
- Reviewing all pertinent reports (WSIB, hygiene, ergonomic, etc.)
- Review WHMIS information binder including Safety Data Sheets

## **Selection of H&S Rep**

- Employees who do not exercise managerial functions are responsible for the selection of their representative through an election process
- Notice of a vacancy will be communicated to all staff and eligible candidates' names will be forwarded to the Health & Safety Coordinator for inclusion in the voting process
- Upon completion of the election, we will notify all staff of the results and post the successful candidate's name on the Health & Safety Bulletin Board.

## **Work Refusal**

The HSR must be present during the supervisor's investigation of a work refusal. If the issue is not resolved, either the employer, the HSR, or the worker, must notify the MOL. The MOL Inspector conducting the investigation will consult with the H&S Rep.

## **Investigation of Critical Injuries or Fatalities**

The H&S Rep has the power to inspect the place where the incident occurred as well as any relevant machine, device or thing and report their findings in writing to the MOL. The HSR can make specific recommendations to senior management in respect of the hazard which led to the injury or fatality.

The HSR will also:

- Ensure prescribed requirements of the [OHSA \(S. 51+52\)](#) and [Industrial Regulations \(S. 5+6\)](#) are carried out as required
- Review all incident investigation reports
- Review all incidents and investigate if deemed warranted by the management

## **Hazard Reporting**

Workers can alert the H&S Rep that they have reported observed hazards to their supervisor, or if the matter was not resolved to their satisfaction.

## **Recommendations**

The H&S Rep can issue a formal recommendation to management at any time.

## **Communication**

The name and work location of the H&S Rep will be posted on the Health & Safety Bulletin Board. Workplace inspection reports will be posted on the H&S Bulletin Board after they are reviewed/approved by the employer.

## **Training**

The H&S Rep will receive training enabling him to effectively exercise the powers and perform the duties of this role. Training will be documented.

## **Evaluation**

The H&S Rep will annually review and recommend enhancements to the health and safety program as well as the health and safety Policy. Any gaps identified in the Evaluation process will be corrected, as



appropriate. Notification of the success of this policy, or any changes made, will be circulated to all departments and posted on the Health & Safety Bulletin Board.

Safety is everyone's responsibility, and understanding the role of our Health and Safety Representative and collaborating with him in terms of health and safety issues in the workplace, is essential in achieving and sustaining this goal.

Sincerely,

Boris Gopka  
Executive Director

Date:

## Health & Safety Rep Recommendations to Management

<b>Facility:</b>			
<b>Date(s):</b>			
<b>RE:</b>			
<b>Reasons for recommendation:</b>			
<b>Requirements for implementation (supporting documentation may be attached)</b>			
<b>Date presented to management:</b>			
<div style="display: flex; justify-content: space-around;"> <span>Day</span> <span>Month</span> <span>Year</span> </div> (the date of this recommendation becomes the reference number)			
<b>Submitted by:</b>			
<b>Recommendation presented to:</b>			
<b>Expected date of response:</b>			
<div style="display: flex; justify-content: space-around;"> <span>Day</span> <span>Month</span> <span>Year</span> </div>			
<b>Note:</b>			
The Occupational Health and Safety Act (OHSA) states that an employer who received written recommendations from the worker health and safety representative shall respond in writing within 21 days.			

## Management Response to Health & Safety Rep Recommendations

<b>Facility:</b>			
<b>Date(s):</b>			
<b>RE:</b>	Response to recommendations received on [Date]		
<b>Date recommendation received by management:</b>			
	Day	Month	Year
<b>Management agrees with the recommendation (circle):</b>	Yes	No	
<p>Note: If management agrees with the recommendation, complete the next section of this form. However, if there is disagreement with or an alternative to the recommendation, please provide reasons or explanation.</p>			
<b>Implementation of recommendation:</b> (timetable, actions taken or to be taken, etc.)			
<b>Disagreement with, or, alternative to, recommendations:</b>			
<b>Date recommendation returned to the H &amp; S Rep:</b>			
	Day	Month	Year
<b>Responding management signature:</b>			
<b>Response received by H&amp;S Rep on:</b>			
	Day	Month	Year





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# Violence and Harassment Policy

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Violence and Harassment Policy

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a Violence and Harassment Policy and Program. Joint Seal Waterproofing is committed to the prevention of workplace violence and are ultimately responsible for employee health and safety. Our management recognizes that all employees have the right to work in a violence and harassment free environment and will take whatever steps are reasonable to ensure these rights are upheld. We are also committed to providing a work environment in which everyone is treated with respect and dignity.

Workplace violence or harassment will not be tolerated. Everyone must be dedicated to preventing workplace violence and harassment. Supervisors and employees are expected to uphold this policy and will be held accountable.

### Definitions

Workplace harassment, including sexual harassment, means engaging in a course of vexatious comment or conduct against an employee in a workplace. A comment or conduct that is known, or ought reasonably to be known, to be unwelcome. Harassment may also relate to a form of discrimination as set out in the Ontario Human Rights Code.

Workplace violence is defined as the exercise of physical force by a person against an employee, in the workplace, that causes or could cause physical injury to the employee. This also includes attempts of violence and statements or behaviours that could be interpreted as a threat of violence.

### Intent

This policy is not intended to limit or constrain the reasonable exercise of management functions in the workplace such as changes in work assignments, scheduling, job assessment and evaluation, workplace inspections, implementation of dress code or disciplinary action.

We will ensure this policy, and the supporting program, are implemented and maintained and that all employees and supervisors have the appropriate information and instruction to protect them from violence and harassment. Supervisors are responsible for ensuring that measures and procedures are followed and that employees have the information they need to protect themselves.

### Roles and Responsibilities

Duties of employer, supervisor, employee, and Health and Safety Representative, as applicable to the Violence and Harassment prevention, are outlined in our Violence and Harassment Program (a separate document).

### Incident Reporting

Employees are encouraged to raise any concerns and to report any incidents of workplace violence or harassment to their supervisor. If the supervisor is involved in the incident, it should be reported to the

Health & safety Representative. Incidents can be reported verbally or in writing by completing the Violence & Harassment Reporting Form. There will be no reprisal for an employee making a genuine complaint. However, if it is determined that a false accusation has been made in bad faith, appropriate measures will be taken.

Any employee who observes, or is a victim of workplace violence, should immediately go to a safe location and report it to their manager or supervisor. Witnesses to workplace violence should ensure their own safety and report it to their supervisor. We will take every precaution reasonable to protect the safety of the complainant(s) during the investigation. If the investigation reveals the existence of any hazard to employee(s), we will advise the potentially affected employees(s) and take every precaution reasonable in the circumstances to protect them.

### **Incident Investigation**

The Executive Director will investigate and deal with all concerns, complaints or incidents of workplace harassment in a fair, respectful and timely manner while respecting employees' privacy as much as possible. Information provided about an incident or about a complaint will not be disclosed except as necessary to protect employees, to investigate the complaint or incident, to take corrective action or as otherwise required by law.

Nothing in this policy prevents or discourages an employee from filing an application with the appropriate Human Rights Tribunal within one year of the last alleged incident. An employee also retains the right to exercise any other legal avenues that may be available.

If an employee needs further assistance, he or she may contact the joint Health and Safety Representative, or the Human Rights Legal Support Centre.

### **Continuous Protection**

To ensure that our employees are working in a safe environment free from violence and any type of harassment, this policy is to be reviewed by senior management at least annually, and records of such reviews shall be retained. A copy of this policy is posted on our company bulletin board and is made available, together with the Violence and Harassment Program, as part of our Health and Safety Manual.

A violence and harassment risk assessment and reassessment must be as often as is necessary to ensure that the related policy and program continue to protect workers, with specific controls to be identified, as pertinent. Our program also outlines what measures must be applied and which procedures must be followed in case immediate assistance is required, including procedures on reporting and investigation. The program is also reviewed annually to ensure its efficacy.

Sincerely,

Boris Gopka  
Executive Director

Date:



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# Violence and Harassment Program

3<sup>rd</sup> Edition

Effective Date:	Jan. 2021		Approved By:	Boris Gopka, Executive Director
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## Violence and Harassment Program

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a Violence and Harassment Policy and Program. Joint Seal Waterproofing is committed to the prevention of workplace violence and is ultimately responsible for employee health and safety. Our management recognizes that all employees have the right to work in a violence and harassment free environment and will take whatever steps are reasonable to ensure these rights are upheld. We are also committed to providing a work environment in which everyone is treated with respect and dignity.

Workplace violence or harassment will not be tolerated. Everyone must be dedicated to preventing workplace violence and harassment. Supervisors and employees are expected to uphold this policy and will be held accountable.

### Definitions

Workplace harassment, including sexual harassment, means engaging in a course of vexatious comment or conduct against an employee in a workplace. A comment or conduct that is known, or ought reasonably to be known, to be unwelcome. Harassment may also relate to a form of discrimination as set out in the Ontario Human Rights Code.

Workplace violence is defined as the exercise of physical force by a person against an employee, in the workplace, that causes or could cause physical injury to the employee. This also includes attempts of violence and statements or behaviours that could be interpreted as a threat of violence.

### Roles and Responsibilities

Duties of employer, supervisor, employee, and Health and Safety Representative, as applicable to the Violence and Harassment prevention, are outlined below.

#### Employer

**Policy and program:** The employer shall prepare a policy and program with respect to workplace violence and harassment, and review them as often as is necessary, but at least annually. The program must be maintained to ensure proper policy implementation.

The employer shall provide workers with information and instruction that is appropriate for the worker on the contents of the policy and program with respect to workplace violence and harassment.

**Risk assessment:** The employer shall assess the risks of workplace violence that may arise from the nature of the workplace, the type of work or the conditions of work.

The employer shall advise the H&S Rep of the results of the assessment, and provide a copy if the assessment is in writing.

**Domestic violence:** If the employer becomes aware, or ought reasonably to be aware, that domestic violence that would likely expose a worker to physical injury may occur in the workplace, the employer shall take every precaution reasonable in the circumstances for the protection of the worker.

**Investigation:** To protect a worker from workplace harassment, an employer shall ensure that:

- (a) an investigation is conducted into incidents and complaints of workplace harassment that is appropriate in the circumstances;
- (b) the worker who has allegedly experienced workplace harassment and the alleged harasser, if he or she is a worker of the employer, are informed in writing of the results of the investigation and of any corrective action that has been taken or that will be taken as a result of the investigation;

**All applicable duties:** Any of the duties outlined in section 25 of OHSA, as appropriate, also apply to workplace violence.

### Supervisor

**Policy and program:** Supervisors shall advise workers on risks of workplace violence from a person with a history of violent behaviour if:

- (a) the worker can be expected to encounter that person in the course of his or her work; and
- (b) the risk of workplace violence is likely to expose the worker to physical injury

**All applicable duties:** Any of the duties outlined in section 27 of OHSA, as appropriate, also apply to workplace violence.

### Worker

**Reporting:** Workers must report any instances of violence and harassment to their immediate supervisors.

**All applicable duties:** Any of the duties outlined in section 28 of OHSA, as appropriate, also apply to workplace violence.

### H&S Rep

**Work refusal:** Handling work refusals is the same for workplace violence and harassment as it is for any other workplace hazard.

**Risk recognition:** H&S Rep should also be able to recognize risks of workplace violence in the course of carrying out their regular functions such as inspecting workplaces.

## Risk Assessment and Controls

### Risk Assessment

Joint Seal Waterproofing will conduct a risk assessment of the work environment to identify potential risks that could impact the organization and the health and safety of employees and will institute measures to eliminate or control any identified risks to employee safety.

The following factors will be considered during the assessment:

- Past incidents of violence;
- Violence that is known to occur in similar workplaces;

- The circumstances in which work takes place, including the type of work and conditions of work; The interactions that occur in the course of performing work; and
- The physical location and layout of the workplace.

The risk assessment may include reviews of records, security reports, employee incident reports, staff perception surveys, health and safety inspection reports, first aid records, or other related records. Areas that will be considered and may contribute to risk of violence include but are not limited to contact with the public, exchange of money, receiving doors, and working alone or at night.

The company will provide the employees at the workplace with a written copy of the assessment and advise of the results.

### Control Measures

If any risks of violence and harassment have been identified, the following measures will be implemented to eliminate or reduce such risks:

- A study of the circumstances in which work takes place, including the type of work and conditions of work to determine potential risks of violence and harassment of any kind;
- A study of the interactions that occur in the course of performing work to determine potential risks of violence and harassment of any kind;
- A study of the physical location and layout of the workplace to determine potential risks of violence and harassment of any kind;
- A binder containing notifications of individuals who have been restricted from company property, kept at reception;
- A procedure to alert the reception and other relevant staff of any new notifications.

Where it is determined that violence or harassment has occurred, control measures will be implemented to eliminate or control the risk of violence or harassment to a worker as a result of the investigation. These control measures will be determined on a case-by-case basis, depending on the situation investigated. Any control measure enacted will be communicated to the complainant and respondent, as well as any other employees the measure effects.

### Disciplinary Measures

Any disciplinary action will be determined by the management and will be proportional to the seriousness of the behaviour or action involved in the incident.

If it is determined by the company that an employee has been involved in an incident of violence or harassment towards another employee, immediate disciplinary action will be taken, up to and including immediate dismissal.

### Requesting Assistance

If a violent or threatening situation is imminent or occurring, the following measures should be taken:

- Place an immediate call to emergency services using “911”

## Incident Investigation and Reporting

### Incident Reporting

An employee who believes they have been subject to violence or harassment should submit a complaint to management. The complaint should be made as soon as possible following the incident and must include the following information:

- The date and time of the incident;
- The name of any persons involved in the incident;
- The name of any persons who witnessed the incident; and A thorough description of what occurred.

An employee who believes they have been subject to harassment may also choose to confront the harasser without filing a formal complaint. They can confront the harasser directly or through writing, detailing the unwelcome behaviour and requesting it to stop.

If the alleged harasser is the employee’s manager, or in a position of power, the complainant can file a complaint with the Ministry of Labour.

### Incident Investigation

Once a complaint has been received, Joint Seal Waterproofing will complete a thorough investigation. The organization will ensure that, where practicable, the investigation is completed within 90 days of the complaint being filed.

#### *The investigation will include:*

- Informing the respondent of the complaint;
- Interviewing the complainant and any persons involved in the incident;
- Identifying and interviewing any witnesses; and
- Obtaining statements from all parties involved.

All of the above information will be documented and used to determine whether an incident of violence or harassment occurred. If necessary, Joint Seal Waterproofing may employ outside assistance or request the use of legal counsel. The worker safety and health representative will not be involved in investigations and will not be provided with any identifying information of the parties involved.

A copy of the complaint, detailing the complainant’s allegations will be provided to the respondent, who will be invited to reply in writing to the complainant’s allegations. The reply

will be made known to the complainant before the case proceeds.

The company will take all measures to prevent any disclosure of the incident and the identities of the parties involved, unless the disclosure is necessary for the investigation, for taking corrective action or required by law.

### *Results of Investigation*

Upon completion of the investigation, Joint Seal Waterproofing will provide both the complainant and respondent a written summary of the findings of the investigation and any corrective action that has been or will be taken as a result of the investigation. This written notification will be provided within 3 business days of the investigation being completed but will not include the full investigation report.

## Providing Victim Support

### Response Procedures

To ensure that the victim receives all the necessary support, the following procedure has been established:

- Using the incident investigation form, the manager or supervisor documents all reports of workplace violence/harassment, hazards and measures taken to address them.
- If the resolution of the incident is beyond the authority of a manager or supervisor, she/he must make the CEO or equivalent aware of the report. The CEO or equivalent involves other managers or supervisors in the investigation as appropriate (e.g., when the incident involves clients or employees under another manager's or supervisor's area of responsibility).
- Management reviews all incident reports, monitors trends and makes recommendations to the CEO or equivalent for prevention and enhancements to the workplace violence and harassment prevention program.
- These findings are shared with the H&S Rep, who is consulted about any revision to the violence and harassment prevention and training program.
- The CEO or equivalent reviews reports of workplace violence/harassment and ensures that actions are taken.

The managers or supervisors who investigate the reported incident warn all staff who might be affected about dangerous situations. They also tell the reporting employee about the outcome of the investigation to help minimize the chance of similar incidents.

If a violent incident results in a critical injury to a worker, the H&S Representative or worker-designate investigates the incident or injury (Section 9(31) OHSA) and reports to the MOL.

### Recommendations to Victims

The company will provide appropriate assistance to any employee who is a victim of violence or harassment. Joint Seal Waterproofing recommends that a worker who has been harmed as a result of an incident of violence at the workplace is advised to consult the worker's health care provider for

treatment or referral for post-incident counselling, if appropriate.

### Record Keeping

Joint Seal Waterproofing will ensure that appropriate records of complaints and investigations relating to incidents of violence and workplace harassment are kept, including:

- A copy of the complaint or details about the incident;
- Any records related to the investigation, including notes;
- A copy of the investigation report (if applicable);
- A summary of the investigation results, including the reports provided to the complainant and respondent; and
- A copy of any corrective action taken to address the complaint or incident.

### Confidentiality

Joint Seal Waterproofing will not disclose the name of a complainant or a respondent or the circumstances related to the complaint to any person except where disclosure is necessary to investigate the complaint or take corrective action with respect to the complaint, or required by law. The company will only disclose the minimum amount of personal information or details necessary for these purposes.

All records of harassment, and subsequent investigations, are considered confidential and will not be disclosed to anyone except to the extent required by law. The company will do everything reasonably possible to protect the privacy of any individuals involved and to ensure that complainants and respondents are treated fairly and respectfully.

### Program Review

In accordance with the Occupational Health and Safety Act, this policy will be posted in a conspicuous place in the workplace and reviewed annually.

Sincerely,

Boris Gopka  
Executive Director

Date:



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# Return to Work and Re-Employment

2<sup>nd</sup> Edition

Effective Date:	Jan. 2020		Approved By:	Boris Gopka, Executive Director
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## **Return to Work and Re-Employment**

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act* and all associated regulations and agreements.

As part of our Health and Safety Program, we have established a Return to Work and Re-Employment Policy and Procedure to ensure a seamless reintegration process. Our management is committed to cooperating with all our employees who have been injured on the jobsite and will do everything we can for an early and safe return to work. We will provide a modified work program to any of our injured employees until he/she is able to return to their pre-accident job, wherever possible.

### **Definition**

Return to work is the process or strategy of safely returning employees to the workplace on a timely basis.

### **Employer Duties**

Joint Seal Waterproofing has the duty of modifying the work or the workplace to accommodate worker needs (to the extent of undue hardship), including the modification of worker duties, providing a re-entry plan, and establishing continuous communication – through the immediate supervisor – with any effected worker until they are safely reintegrated into the workplace.

The employer also has the duty to keep WSIB informed about everything related with Return to Work and Re-Employment. Please, see the corresponding sections below, including our Return to Work Procedure, for details.

Sincerely,

Boris Gopka  
Executive Director

Date:



## Return to Work Procedure

### Roles and Responsibilities

#### Employer

The employer will take the following steps to ensure any employees' smooth transition back into the workplace:

- Contact injured worker ASAP and stay in regular contact. Cooperate in providing suitable work.
- Give WSIB information as required.
- Provide workers with the Functional Abilities Form to take to the testing practitioner for completion.
- Educate workers about the return to work program.
- Set specific time frames for the return to work.
- Review worker's progress regularly.
- Pay full wages and benefits for the day or shift on which the injury occurred.
- Make certain that workers understand their obligations to co-operate.
- Set clear procedures to follow in reporting injuries

#### Worker

The employee will take the following steps in case of injury:

- Contact supervisor immediately of any injury. If not available, phone office and contact employer.
- Stay in regular contact.
- Help identify and cooperate in suitable work arrangements.
- Give WSIB information as required.
- Choose a doctor or qualified practitioner.  
**NOTE:** A change in doctor cannot be made without permission of WSIB.
- Return the Functional Abilities Form completed by the testing practitioner within 24 hours, to develop with the employer an early and safe return to work.

### Accommodation

Joint Seal Waterproofing will provide a change or modification to the job or workplace so that the work is within the injured or ill person's functional capabilities, and the risk of injury is reduced.

#### Types of Accommodations

Any of the following types of accommodation may be arranged:

- Reduce hours
- Graduate RTW hours
- Re-assign duties
- Restructure the job
- More frequent rest breaks
- Work platform vs. ladders
- Ladders for climbing scaffolds
- Mini stretch breaks (10-15 minutes)
- Chair with back support vs. picnic table

- Anti-vibration tools (e.g. anti-vibration jackhammer)
- Make heavy tools available at waist height
- Light shop work, general clean-up
- Painting trailers, containers (light work with brush)
- Washing trucks
- Pickup or delivery of plans
- Training in their selected field, where possible
- Computer training in safety prevention, if available
- Increasing of awareness

## Return to Work – Re-Entry Plan

To ensure that workers can return to work safely and as soon as possible, the employer will take a series of steps, following our established re-entry plan.

### Re-Entry Plan

#### Communication

##### Worker:

1. The injured worker must stay in touch with his/her supervisor and/or employer regularly, and notify them of any changes in his/her condition.
2. The employee must return the Functional Abilities Form completed by the testing practitioner within 24 hours, to develop with the employer an early and safe return to work.

Employer: The immediate supervisor and/or manager must contact the worker on a regular basis (at least once a week) to check on their progress.

#### Accommodation and Return to Work

##### Worker:

1. The injured worker should help identify possible work arrangements and cooperate in making the new accommodations work out.
2. Provide information to WSIB if requested.

##### Employer:

1. The employer must set a specific time frame for return to work.
2. Educate workers about the return to work program to make sure the workers understand their obligations and cooperate accordingly.
3. Pay full wages and benefits for the day or shift on which the injury occurred.
4. Provide accommodations, as needed, to help the worker return to work safely and as soon as possible (consult the type of accommodation that can be provided in the *Return to Work Procedure* section above).

## Return to Work – Contact Log

Use the following form to record basic information.

Employee's Name:		Phone:	
Supervisor/Manager:		Phone:	
Return to Work Date:		Review Date:	
Target End Date:			
Treating Physician(s):		Phone:	
WSIB Claim Number:		Phone:	
Claims Adjudicator:			

## Record of Contact

Date of Contact	Person Contacted	Contents of Conversation

### Modified Duties

It is the supervisor's responsibility to ensure this form is kept up-to-date and in the Claims Management file established for the injured worker. If modified duties are required, the supervisor must complete the following, in consultation with the Health and Safety Coordinator, injured worker and appropriate health care providers.

<b>Description of Employee's Job</b> (Attach Physical Demands Report for Employee's Job)	
<b>Transitional Work Plan</b> (if required)	
Pre-Injury Job	
Is other suitable work required? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If yes, what is the other suitable work?	
Pre-Injury Job with accommodations (specify)	
Other suitable work with accommodations (e.g. wages, hours, rotation, minimum/maximum)	
<b>Medical Precautions</b> (Attach Functional Abilities Report, if applicable)	

## Return to Work – Additional WSIB Forms

Additional forms are available from the WSIB to help the Return to Work process by providing clear information to all involved parties (i.e. the worker, employer, health professional and WSIB). These forms are not reproduced here, but links to the WSIB website are provided for online completion.

### [WSIB Form 7](#) – Employer's Report of Injury/Disease

- COMPLETE THIS FORM AND SUBMIT TO WSIB FOR EVERY INJURY INVOLVING LOST TIME OR MODIFIED DUTIES
- Provides preliminary information on injury details from employer to WSIB and worker
- Initiates process of returning injured worker to work using subsequent forms

### [WSIB Form 1492](#) – Worker's Claim/Consent Form

- COMPLETE THIS FORM WHEN UNABLE TO OBTAIN INJURED EMPLOYEE'S SIGNATURE ON A FORM 7
- Keep 1 copy and send copies to the injured worker and the Treating Practitioner
- To be completed by employer
- Copies to be sent to the employee and to the health professional for Return to Work program

### [WSIB Form 156](#) – Treatment Memorandum

- COMPLETE THIS FORM AND SUBMIT TO THE TREATING PRACTITIONER AFTER INJURED WORKER RECEIVES TREATMENT
- Provides communication between employer and treating Health Professional/Hospital with respect to an employer contact and who, what, and when of injury

### [WSIB Form 2647](#) – Functional Abilities Form for Timely Return to Work

- COMPLETE THE EMPLOYER SECTIONS OF THIS FORM AND SUBMIT TO TREATING PRACTITIONER FOR COMPLETION
- Provides clear information from the Health Professional to the WSIB about capabilities and limitations of the worker's current physical condition
- Allows employer to choose suitable modified work for injured worker

### [WSIB Form 9](#) – Employer's Subsequent Report

- COMPLETE THIS FORM AND SEND BACK TO WSIB
- Provides information from the employer to the WSIB when the injured worker returns or is able to return to work

### Letter to Health Care Practitioner

- Notifies Health Care Practitioner that a Return to Work program exists to re-introduce the injured worker into a productive capacity
- Provides instructions on completion and delivery of forms

### Letter to Worker

- Informs worker of their role in the Return to Work process
- Provides instructions on completion and delivery of forms

### Duties and Precautions Form – Return to Work Plan

- Acknowledges physical limitations as identified in worker's completed WSIB Form 2647 – Functional Abilities Form
- Identifies physical components of work to be performed
- Sets out a plan for modified duties and gradual increase of workload
- Sets out weekly objectives over an 8-week period
- Examples of modified work could be:
  - a. General clean up
  - b. Sweeping (when no lifting allowed)
  - c. Material handler (when light lifting allowed)
  - d. Material receiver
  - e. Equipment cleaning
  - f. Inventory
  - g. Design layout (training required)
  - h. Secondary supervision/foreman
  - i. Safety representative/accident investigator
  - j. Project traffic control
  - k. Signal person





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## Management Review

2<sup>nd</sup> Edition

Effective Date:	Jan. 2020		Approved By:	Boris Gopka, Executive Director
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## Management Review

At Joint Seal Waterproofing, we regard our employees as the most valuable asset in our organization. We are committed and accountable for providing a safe and healthy work environment through a proactive occupational health and safety program, in compliance with the *Occupational Health and Safety Act*, and all associated regulations and agreements.

As part of our Health and Safety Program, we have established this Management Review policy and its accompanying procedure to ensure that the Joint Seal Waterproofing management team reviews Company Health and Safety policies, procedures and programs on an annual basis, or as appropriate, to ensure compliance with applicable regulations and/or address any changes to the work environment.

### Guidelines

With the Health and Safety Program in place, Joint Seal Waterproofing management team shall review it annually – or more frequently, if needed – to verify current applicability. Reviews will include an examination of hazard controls currently in place, safe work procedures in use and additional assessments, as appropriate to ensure that working conditions remain safe at all times. Reviews will be conducted in accordance with the following guidelines:

#### 1. Annual Review

Joint Seal Waterproofing will conduct an annual review of organizational health and safety policies to ensure that they remain up-to-date and appropriate. Joint Seal Waterproofing will review the previous hazard assessments and reassess each year to ensure that the working conditions remain safe, and that workers understand and apply the safe work procedures set out previously. By performing annual reviews, the organization gains insight into potential issues, and can proactively address workplace safety concerns.

#### 2. Introduction of a New Task or Process

In the event that a new task or process is introduced to the work environment, Joint Seal Waterproofing will review and revise the process of hazard identification, analysis, assessment and the creation of safe work procedures to ensure that this task is completed in a safe manner at all times and does not negatively affect the safety of associated operations.

#### 3. Tasks or Procedures are Modified

Where a change occurs that alters the established safe work procedures (e.g. when a new piece of equipment is acquired or there is a change of materials), the process of review must be followed to ensure that the work is safe, and that procedures are adjusted accordingly.

#### 4. New Hazard Controls are Implemented

Where new hazard controls are implemented, Joint Seal Waterproofing will ensure that the work is reviewed and assessed. This measure is intended to ensure that the form of control is working to eliminate and/or control the hazard as intended, and has not created a new hazard.

## Management Review Procedure

The entire Occupational Health and Safety Program (OH&S Program) shall be reviewed by management during the month of December, every year, to ensure its applicability and efficiency. Management is responsible for reviewing each element of the company's health and safety manual, determining the objectives to ensure continuous improvement, and establishing an action plan to make sure those objectives are achieved. Records of these three actions shall be kept with the version of the manual being reviewed.

The following elements of Joint Seal's OH&S Program shall be reviewed by management:

### Elements to review

- Internal records: inspections, hazard assessments, incident reports, statistical reports, etc.
- External communications: evaluations conducted by other parties, evaluations of legal compliance etc.
- Follow-up actions from previous management reviews.
- Changing circumstances, including developments in legal and other requirements related to OH&S (changes in business conditions, organizational structures, materials and services, legal and other requirements)
- Key performance indicators: make sure they have been developed, measured and analyzed to determine the overall OH&S performance. Comparison from previous statistics should be reviewed, and any future steps necessary to prevent reoccurrence should be implemented.
- Objectives: OH&S objectives review must be done to determine whether they have been met.
- Opportunities for improvement: these must be identified, and changes – if any – must be made to the OH&S management system.
- Changes: If needed, changes to the OH&S policy and objectives must be made.

### Action Plan

An action plan must be developed based on the findings resulting from the review.

### Communication

The results of the review and the Action Plan must be communicated to the employees: they will be posted on the company's bulletin board and will be available in a corresponding binder.

Sincerely,

Boris Gopka  
Executive Director

Date:

### Acknowledgement and Agreement

I, (Employee Name), acknowledge that I have read and understand the Health and Safety Management Review Policy of Joint Seal Waterproofing. Further, I agree to adhere to this policy and will ensure that employees working under my direction adhere to this policy. I understand that if I violate the rules/procedures outlined in this policy, I may face disciplinary action, up to and including termination of employment.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Witness: \_\_\_\_\_