

Black&McDonald

**Health and Safety
Handbook
2026**



Revision List available upon request.



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The logo consists of a rectangular box with a black border. It is divided into three horizontal sections: a black top section, a white middle section containing the text 'CORPORATE HSE POLICY' in bold black capital letters, and a green bottom section.

CORPORATE HSE POLICY

Black & McDonald and its affiliated companies believe that keeping people safe and healthy is a core value. We are committed to creating an environment where all workplace parties are protected from injury and illness.

Our Senior leaders are dedicated to prioritizing and maintaining the physical, psychological, and social well-being of their managers, employees, contractors, suppliers, visitors, and all affected stakeholders.

We set health and safety goals and objectives and regularly review them to keep improving. These goals and objectives are fulfilled through clear communication, proper supervision, education, training, and providing the right resources.

In our efforts to protect people, property, and the environment, Black & McDonald and its affiliated companies pledge that every precaution reasonable in all circumstances will be taken for the protection of all employees and affected stakeholders. This commitment is upheld through the consistent application of our HSE Management System, which is in compliance with or exceeds legislative

requirements.

The Black & McDonald HSE Management System will be reviewed annually to ensure that all employees display competence in their roles and responsibilities. We believe that a safe and healthy work environment is the right of every employee and can be established and sustained only through a united effort by all workplace parties, including consultation and cooperation with workers.

The prevention of incidents and the provision of safe and healthy working conditions is everyone's responsibility - from senior leaders to front-line workers, to subcontractors, suppliers and vendors. Employees at every level are expected to protect themselves and others and support Joint Health and Safety Committees in striving for excellence. Black & McDonald and its affiliated companies are committed to providing proactive leadership and support to achieve our goals.

Every employee plays a vital role in implementing this policy. It is an expectation that all employees, subcontractors, suppliers, service providers, and vendors are involved in and supportive of the HSE Management System and hold the protection of the environment as a core value when carrying out everyday business activities.



J. Bruce McDonald

Co-President and Chief Executive Officer



Ian McDonald

Co-President and Executive Officer

1.1 HSE Rules

A rule is a standard that establishes a code of conduct or action that is expected by the organization. All Black & McDonald company rules are influenced by the local authority having jurisdiction.

All workers must adhere to Black & McDonald Limited rules outlined in this Health, Safety and Environment (HSE) Handbook at all times.

Supervisors are responsible to communicate these company rules and local legislation to workers under their directive.

- The company's Corporate Health and Safety, and Environmental Policies shall be followed.
- HSE legislation prescribed by the local authority will be strictly adhered to.
- Operators of vehicles and equipment shall have a valid and relevant driver/operator's license.
- For insurance purposes, company vehicles are for company permitted use and worker transportation only.
- Possession or consumption of alcohol, cannabis, and/or banned substances during working hours, breaks and/or lunchtime is not permitted. Likewise, reporting for work while under the influence is not permitted.
- All incidents, near misses, hazard identifications and safety opportunities are to be reported to the Foreperson and/or Supervisor immediately and appropriate forms filled out by the end of the working

day to start the investigation process (as required).

- All incidents must be reported, investigated, and documented.
- Work areas are to be kept neat and tidy. At the end of each day the site is to be cleaned up.
- No worker **shall** operate tools and / or equipment without receiving the appropriate required training.
- Use appropriate access and egress points, walkways and travel paths. Do not take shortcuts.
- Generally, personal use of cellular devices is prohibited during work, except in emergency situations. Prohibited use includes the use of headphones/ear buds as it can cause distraction and limit transfer of important communications. If necessary, advise your supervisor of emergency calls and only answer/make these calls when you are in a safe location, preferably away from work activities.

1.2 Worker's Rights

- **The Right to Know**
Workers have the right to know about any actual and potential hazards to which they may be exposed. This means the right to be trained and to have information on machinery, equipment, working conditions and hazardous substances.
- **The Right to Participate**
Workers have the right to be part of the process of identifying and resolving

workplace health and safety concerns. This right is expressed through membership on Joint Health and Safety Committees, or through worker HSE Representatives

- **The Right to Refuse Unsafe Work**

Workers have the right to refuse work, without reprisal when there are reasonable grounds for believing that the act is likely to endanger that worker or the health and safety of any other person.

- **The Right to Freedom from Harassment, Discrimination and Violence**

Every person who is an employee has the right to freedom from harassment, discrimination, and violence in the workplace by the employer, agent of the employer, or another employee.

1.3 Work Refusal Process

Stage 1:

1. Worker reports refusal to their supervisor. Worker may also wish to notify the worker and/or management representative. Worker moves to and remains in a safe place.
2. Employer or supervisor investigates in the presence of the worker and the worker safety representative.
3. Either:
 - a. Issue resolved: Worker goes back to work.
 - b. Issue not resolved: Proceed to second stage.

Stage 2:

1. With reasonable grounds to believe work is still unsafe, worker continues to refuse and remains in a safe place. Worker or employer or someone representing the worker or employer call the authority having jurisdiction.
2. Labour authority having jurisdiction investigates in the company of the worker, safety representative and supervisor or management representative. *
3. Labour or HSE authority inspector gives decision to worker, management representative/supervisor and safety representative in writing.
4. Changes are made if required or ordered. Worker returns to work.

*Pending the local authority having jurisdiction investigation:

- The refusing worker may be offered other work if it doesn't conflict with a collective agreement.
- Refused work may be offered to another worker, but management must inform the new worker that the offered work is the subject of a work refusal. This must be done in the presence of a member of the JHSC, a health and safety representative, or worker selected by trade union or workers to represent them.

INTERNAL RESPONSIBILITY SYSTEM

2.1 Company Responsibility (Employer)

Black & McDonald Limited accepts the responsibility for providing the leadership of the Health, Safety and Environmental Management (HSE) System and has implemented the following:

- Incident prevention onsite through co-operation between supervisors and trades persons.
 - The provision for Pre-Job Hazard Assessment, Controls Implementation and Emergency Response Planning prior to starting work.
 - To ensure that programs are maintained in accordance with current local Legislation.
1. Management and worker site safety meetings and follow-up minutes that must be posted.
 2. HSE updates through (where relevant) meetings, reports, communications & alerts for all staff.
 3. Providing leadership for the Health, Safety and Environmental Management System.

2.2 Senior Management Team

- Senior Management of Black & McDonald

Limited set policy, provide a strategic leadership perspective, set expectations, and provide the resources necessary for success.

- Promote an open and trusting environment and understand how their behavior impacts others. Commitment is demonstrated through active and visible participation.
- Clear goals and objectives are established for the HSE Management Systems, and performance is evaluated against these goals and objectives.

2.3 Regional Manager / Division Manager / General Manager

Reporting to the Regional Vice President, this level of

regional leadership will have responsibility specific to one or more areas of disciplines such as: Service/FMO contracts engineering, procurement, construction, pre-commissioning, and upon request – “start-up standby” of the project; and will promote the philosophy that every incident is preventable by providing competent leadership of the HSE Management System. Prior to the start of and during any project the Manager(s) will be responsible and accountable for the following:

- Shall create a culture where HSE is integrated into the daily business with the equal weighting factors associated to scheduling, productivity, quality and cost effectiveness through positive behavior including: the provision of necessary physical and financial human resources, and time management support; incorporating the use of document control,

record keeping and visibility, ensuring HSE active leadership approach; providing comprehensive written communication and clear expectations to the project team on a personal basis; and actively participating in recognizing both individual and group achievements;

Measure HSE accountability of all line management level competencies through personal monitoring of HSE performance factors, including written goals and objectives, from beginning to end. Completion of site tours, formal site inspections, participating in a collective line management hazard and risk assessment, ensuring the Black & McDonald Drug and Alcohol program is adopted, evaluating Project Safety Plans, and reviewing written documents are several monitoring methods.

2.4 Project Manager / Project Coordinator / Contract Manager

The Manager will have the direct responsibility for the management of the scope of work and should be directly

accountable to the Regional/Division Manager, with the following HSE expectations:

- Demonstrate ownership, active leadership through positive behavior, and participate in all aspects in accordance with the HSE Management System – inspections, observations, written communications, information sharing, tours, walkabouts,

and positive recognition and employee perception surveys.

- Submit a Project Safety Plan prior to commencement of work.
- Complete the Black & McDonald Supervisor HSE Fundamentals, as assigned.
- Communicate the HSE responsibilities to each direct report on a personal basis.
- Measure HSE accountability of all reporting line management levels through personal monitoring of project HSE performance factors.
- Participate in a collective line management hazard and risk assessment, including change management, of the scope of work for the project which includes identifying all applicable legislation.
- Ensure a preventative maintenance program is established for the equipment critical for safety.
- Ensure a contractor/subcontractor selection (HSE) process has been established and completed for the project.
- Ensure Drug and Alcohol Policy is fully implemented, prior to the start of the project, as may be applicable.
- Ensure Pre-Job Hazard Assessments are conducted prior to the start of new work/at the beginning of shift and when conditions change.
- Significantly contribute to the creation of a project culture where HSE is integrated into the daily business with the equal weighting factors associated to scheduling, productivity, quality, and cost effectiveness.

- Promote open communication, cooperation, and trust between all stakeholders to optimize the project HSE objectives.
- Monitor and commend/correct compliance to established HSE Management System requirements of all levels of management, contractors, subcontractors and workers, review findings accordingly.
- Lead and/or participate in audits and investigation of major/unacceptable incidents and monitor the completion and communication of corrective actions.
- Actively promote Black & McDonald's HSE goals and objectives, where we believe that all incidents are preventable.

2.5 Field Supervision / Superintendent / General Foreperson / Supervisor

This level of management should be responsible for the daily, direct supervision of the “hands-on” workers. They should be responsible to plan and organize the work within a safe and healthy working environment. The HSE collective responsibilities of these positions under the leadership of the Superintendent is as follows:

- Become knowledgeable in the HSE Management System and individual responsibilities, as identified for the work to be performed. Communicate the responsibilities effectively to each direct report.
- Demonstrate ownership, active leadership through positive behavior, and participate in all aspects of the HSE Management System – inspections, observations, written communications, information

sharing, tours, walkabouts, positive recognition, and employee perception surveys.

- Complete the Black & McDonald Supervisor HSE Fundamentals course.
- Communicate the HSE responsibilities to each direct report on a personal basis and monitor performance.
- Ensure that all workers are fit for work, trained and competent to perform their assigned tasks.
- Ensure the proper equipment and materials are readily available to the workers, and that pre-use inspections are performed.
- Participate in a collective line management hazard and risk assessment of the scope of work for the project which includes identifying all applicable legislation.
- Review B&M's Drug and Alcohol Use Policy with workers, prior to the start of the project, as may be applicable.
- Participate in the pre-job planning and hazard assessment on all new or potentially hazardous work through the Project Safety Plan process.
- Ensure Pre-Job Hazard Assessments (PJHA) are conducted prior to the start of new work/at the beginning of shift and when conditions change.
- Supervise the workers to ensure compliance to the project management system policies, standards, procedures, safe work practices and rules.
- Significantly contribute to the creation of a project culture where HSE is integrated into the daily business with the equal weighting factors associated to

scheduling, productivity, quality, and cost-effectiveness.

- Promote open communication, cooperation, and trust between all stakeholders to optimize the project HSE objectives.
- Ensure that all the crew workers know and understand their specific HSE responsibilities and are held accountable for their behaviors.
- Monitor and commend/correct compliance to established HSE Management System requirements of all levels of management, contractors, subcontractors and workers, review findings accordingly. Implement appropriate action plans.
- Conduct serious/minor investigations, HSE meetings, toolbox meetings, Pre-Job Hazard Assessments (PJHA) for each new work plan, and prepare all required reports for submission, approvals, record keeping.
- Actively promote Black & McDonald's HSE goals and objectives, where we believe that all incidents are preventable.
- Actively support the HSE personnel assigned to the project/workplace within their roles of advisor, monitor, resource, and auditor.

2.6 Workers

Workers are defined as persons engaged in an activity or occupation for monetary gain. All will be responsible and accountable to maintain a safe and healthy working environment to minimize the occurrence of workplace incidents by participating in Black & McDonald's HSE Management System, including but not limited to:

- Be familiar with and comply with proper HSE policy, programs, and safe work practices.
- Use the required HSE devices and proper personal protective equipment applicable to the potential loss exposures/controls associated to the tasks to be performed.
- Notify Supervision immediately of unsafe acts/conditions, near misses, property damage, traffic accidents, and violence and/or harassment.
- Report all incidents immediately to direct supervisor.
- Carry out work in a manner that will sustain a safe working environment for people, equipment, material, and the environment.
- Actively engage in suggesting ways and means to reduce risk/potential losses (Hazard ID, Safety Opp.).
- Participate in the Pre-Job Hazard Assessment prior to initiating each job/task.

Consistently be aware of how off-the-job activities and lifestyle may impact job performance and impact their ability to be physically and mentally fit for duty.

2.7 Joint Health and Safety Committee/H&S Representatives

- Monitor the functioning of the IRS and make recommendations for its improvement.
- Inspect the workplace monthly for the purpose of ensuring risks are continually being reduced.
- Participate in the investigation of serious incidents and other events to assist in

identifying, recommending and elimination of fundamental causes of losses.

- Assist in the development of safe and healthy working procedures.
- Monitor the elements of the HSE Management System (policies and programs) and to suggest ways to improve them.
- Contribute to the health and safety assessments of new facilities, equipment, material, and processes.

2.8 Subcontractors

The provisions of HSE responsibilities as outlined in this.

section apply to all Black & McDonald subcontractors and their workers:

- Provide HSE statistics to the Subcontractor Management Program portal.
- In the absence of a Subcontractor HSE Manual, Black & McDonald Policies/Procedures/HSE Manual are to be followed.
- Adherence to Black & McDonald (or more stringent) Drug & Alcohol Use policy
- Report all incidents and participate in Incident Investigation procedures.
- Participate in kick-off (pre-start) meeting.
- Participate in the completion of Pre Job Hazard-Assessments
- Subcontractors to complete B&M subcontractor orientation
- Refer to the Black & McDonald BM-P36 Subcontractor Management Program

2.9 Visitors

- All Visitors to Black & McDonald offices, sites, projects must sign into the visitor logbook before entering the building/site and must sign out when leaving.
- Visitors may be required to be escorted by a designated person and wear the appropriate personal protective equipment for the workplace location.
- Visitors may be required to complete an orientation and may also require additional training.

2.10 Vendors and Suppliers

- Depending on the volume and nature of work, vendors and suppliers may potentially create an HSE risk.
- Vendors and suppliers are required to provide an HSE Management System that is equal to or exceeds Black & McDonald requirements. Alternatively, the vendor or supplier can adhere to Black & McDonald's HSE Management System.
- Vendors and suppliers must be qualified through Black & McDonald's subcontractor portal.



3.1 Guidelines for Incident Prevention

3.1.1 Client, Public and Co-Worker Protection

Where Black & McDonald Limited is responsible for client, public, and co-worker protection as outlined by the authority having jurisdiction, the HSE measures shall be addressed and identified in the preparation of the Project Safety Plan.

Daily hazards are acknowledged and mitigated with the Pre-Job Hazard Assessment (PJHA). The actions identified in the Project Safety Plan and PJHA will be implemented at the start of a job and monitored on an ongoing basis.

3.1.2 Training and Education

An integral part of incident prevention is the education program that ensures information reaches workers at all levels and in all areas of the Company's operation.

All workers are made aware of the Pre-Job Hazard Assessment process. Further training can be provided, as necessary.

Documentation of all education and training must be kept and logged. Anyone engaging in supervisory tasks or work or responsible for a work site **shall** take the Black & McDonald Supervisor HSE Fundamentals course.

3.1.3 Job Competency

Competent person means a person who:

- is qualified because of knowledge, training, and experience to organize the work and its performance,
- is familiar with health and safety legislation that applies to the work, and.
- has knowledge of any potential or actual danger regarding health or safety in the workplace.

Minimum qualifications must be identified for each role to verify competency. Job competency must be verified prior to worker's performing tasks independently.

3.2 Incident Reporting Standard

1. All incidents, regardless of their severity, **must** be reported to the direct supervisor as soon as reasonably possible after the incident.
2. Please reference BM-P33 Incident Communication and Management program for more information.

3.3 Incident Investigation

1. Incidents that meet the Serious Incident criteria are required to be investigated.
2. All incidents, regardless of severity, are subject to investigation at the discretion of

the Regional SVP/Vice President, HSE.

3. Workers not cooperating with the investigation process are subject to disciplinary action.

3.4 Corrective Action

Corrective actions or recommendations may include, but are not limited to:

- Training/retraining for appropriate person(s)
- Improved personal protective equipment.
- Equipment repair or replacement
- Correction of a congested area/storage
- Installation of a guard or safety device
- Actions to improve a procedure.
- Further assessment by the manufacturer and/or review of their specifications
- Verification or further assessment by vendor or another third party

3.5 First Aid

1. **Managers or Supervisors can contact the Urgent Injury Triage Program to determine the level of care required for the injury with the assistance of the on-call nurse.
1-844-544-7256**
2. **Reminder: It is important to inform the HSE Advisor/Manager before and/or after calling.**
3. It is strongly recommended that all Supervisors enroll in a First Aid course based on local legislative requirements. Prompt and correct treatment of injuries, both on and off the job, cannot only

reduce pain and suffering, but save lives as well. Basic first aid concentrates on breathing, bleeding, and burns.

4. All work injuries/illnesses/incidents must be documented and reported to immediate Supervisor.
5. Certified First Aid Workers and First Aid Kits must be available to workers (office and field) to assist injured workers.

3.5.1 Bleeding

If the injured worker is bleeding from an external wound, control the bleeding immediately. Wear protective gloves to prevent contact with the worker's blood.

1. Apply direct pressure to the wound with a clean, preferably, lint-free dressing. (Exception – never apply pressure to a wound that has an impaled object imbedded into the body - use a tourniquet. Never attempt to remove the impaled object from the wound).
2. Lay the injured person down in the recovery position. Do not let the injured person sleep.
3. Elevate the injured body part if possible.

3.5.2 Burns

1. For minor burns, flush area with cool water. Cover the burn area lightly with a clean, lint-free, loose dressing and get medical help.
2. For serious burns, cover the injured area with clean, damp dressings and get medical help. Do not apply creams, lotions, or ointments.
3. Do not pick, pop, or remove blisters.

4. Do not pull clothing stuck to the burned areas.

3.5.3 Breathing/Unresponsive Person

If the injured person is not breathing, start chest compressions immediately if you are First Aid Certified and call or have someone call 911.

Hands-Only CPR*

Three steps you can handle



Phone 9-1-1 and shout for an AED.



Push hard and fast in the centre of the chest.



Use an AED if available.

*Hands-Only is a service mark of the American Heart Association, Inc., used under license.

3.5.4 Stroke Symptoms

Remember **FAST**:

- **Face** – facial numbness or weakness, especially on one side
- **Arm** – arm numbness or weakness, especially on one side
- **Speech** – slurred speech or difficulty speaking or understanding
- **Time** – time is important; call EMS/9-1-1 immediately.

Other signs and symptoms of a stroke include:

- A sudden, severe headache.
- Dizziness or confusion.
- Unconsciousness or temporary loss of consciousness.
- Sudden loss of bladder control.

3.5.5 Shock (Non-Electric)

Persons suffering from serious injuries may lapse into shock. Signs of shock include drowsiness, paleness, disoriented, clammy skin and weak pulse. Medical help is required.

1. Reassure the injured person that help is coming.
2. Place the injured person on their back with feet elevated unless injuries make this difficult. Otherwise, place injured person in a comfortable position that allows for easiest breathing.
3. Loosen clothing around neck, waist, and chest.
4. Keep the injured person warm.
5. Watch for signs of breathing trouble.

3.5.6 First Aid Kits

1. Each project **shall** have a First Aid Kit. The size and contents will vary (refer to specific local legislation) to suit the needs and numbers of workers on site.
2. Every worker **shall** know where the closest First Aid Kit is located and who is First Aid & CPR trained.

3.5.7 Allergic Reactions

An allergy occurs when your body's immune system sees a certain substance as harmful. There are many types of allergies; some are seasonal while some are year-round. A serious allergic reaction is called anaphylaxis. Anaphylaxis is a medical emergency and requires proper planning for the prevention and appropriate response. Emergency response plans should consider potential allergies such as dust, insects, latex, certain chemicals, and food.

Being prepared for an allergic reaction includes the administration of epinephrine (Epi-Pen), and quick access to medical attention.

Those with known, severe allergies may carry an Epi-Pen with them. An Epi-Pen (epinephrine auto-injector) is a way to deliver medication to someone experiencing an anaphylactic episode.

1. Known anaphylactic allergies requiring the use of an Epi-Pen should be self-declared by the employee to manager/supervisor.
2. When someone is experiencing anaphylaxis, the following steps should be followed:
 - i. Call 911 immediately.
 - ii. Ask the person if they are carrying an Epi-Pen. If yes, ask if they need your help administering the injection.
 - iii. Administer the Epi-Pen
 - iv. Loosen any tight-fitting clothing.
 - v. Help the person lie on their back. If they are feeling nauseous or have vomited, gently turn them on their side. Also, turn them on their side if they are unconscious, pregnant, or having trouble breathing.
 - vi. Remove any allergy triggers, if possible
 - vii. Cover the person with a blanket, if available
 - viii. Avoid giving them any food or drink.
 - ix. If there are no signs of breathing,

- have a qualified person administer CPR.
- x. Stay with the person until help arrives.

To administer an Epi-Pen:

Blue to the Sky

- Grasp with orange tip pointing downward.
- Remove the blue safety cap by pulling straight up (Do not bend or twist)

Orange to the Thigh

- Place the orange tip against the middle of the outer thigh.
- Swing and push the auto-injector firmly into the thigh until it “clicks.”
- Hold firmly in place for 3 seconds (count slowly)

3.6 Transport to Medical Facility

1. It is the responsibility of the supervisor to arrange for transport of the injured worker to the nearest medical facility.
2. Whenever possible, the supervisor shall be the one providing transport to the injured worker.
3. For minor injuries that do not require a licensed ambulance, the supervisor, or designate, shall transport the injured worker to the medical facility. They are required to remain with the injured worker until their release from the medical facility, or until a family member or friend can accompany the injured worker.
4. If unsure that the employee requires access

to a medical facility, contact Emergency Services.

3.7 Emergency Response to Electrical Incidents

3.7.1 Equipment Contact with Overhead Wires

1. Never touch equipment and the ground at the same time
2. Get someone to call the local utility to shut off the power.
3. If possible, break contact by driving the equipment clear of the powerline.
4. Do NOT leave the equipment until the utility shuts down the power or fire forces you to jump clear.
5. Keep everyone away from any equipment in contact with a powerline.
6. Beware of time relays. Even after breakers are tripped by line damage, relays may be triggered to restore power.

3.7.2 Equipment Contact with Under Ground Facilities

1. Stop work immediately.
2. Contact 911 and the utility owner.
If gas or telecommunications line has been struck, clear the vicinity immediately.
If an electrical line has been contacted:
 - a. the person operating the equipment should remain in the equipment.
 - b. Those within the vicinity should

not move and keep both feet on the ground and together.

- c. Do not touch any equipment or materials near the site.
- d. Do not exit the area until the utility owner has given permission to proceed
- e. If there is an immediate risk, those near the point of contact should jump (NOT STEP) away from the equipment and land with both feet together. Then, they should move at least 30-35 feet away using short hops so that their feet always land on the ground at the same time.

3.7.3 Human Contact with Live Electrical

1. Turn off the source of electricity, if possible.
2. If not possible to turn it off, move the source away from the person using a dry, non-conducting object made of cardboard, plastic, or wood.
3. Call 911
4. Begin CPR if the person shows no signs of circulation such as breathing, coughing or movement.
5. If the person has burns to their skin, cover the injuries with a clean, dry cloth to limit the risk of infection.

HSE PROCESS / MANAGEMENT SYSTEM

4.1 Project Safety Plan (PSP)

A Project Safety Plan is a written document outlining all the information a worker needs to know about working safely on a job site or project. These plans are required at all Black & McDonald projects/sites that are over \$50,000, or if the work presents critical hazards.

It is the responsibility of the Project Manager/Project Coordinator/Contract Manager to complete and ensure that each employee involved in the project reviews and understands its contents prior to starting work.

4.2 Pre-Job Hazard Assessment (PJHA)

Pre-Job Hazard Assessments are required prior to beginning any task. These assessments are used as a tool to ensure all known and potential hazards are identified, assessed, and controlled at the site level. They require re-assessment when the task, the environment, or the crew changes or new hazards are presented. When changes occur, or new hazards are presented, the change in work plan must be communicated with all affected workers.

With the assistance of workers, supervisors are required to complete the PJHA and ensure its contents are communicated with those on site, including any visitors or subcontractors. On-going hazard communication is required to ensure the PJHA is accurate and up to date.

4.3 HIERAC / Risk Assessment / Hierarchy of Controls

Hazard Identification Elimination Risk Assessment and Controls (HIERAC) process specifies requirements for the identification of HSE hazards, their elimination where practical, and the assessment and control of the risks associated with the remaining hazards.

Hazard sources should be identified and analyzed based on available data to determine how it can potentially harm a worker, do damage to equipment, machinery, property, or the environment. These sources can include, but are not limited to objects, chemicals, biological agents, physical agents, animals or wildlife, cognitive demands, ergonomics, severe weather, or external to the site.

To analyze the risk, the level of likelihood and consequence needs to be determined. The results of this risk analysis provide input to risk evaluation decision-making on whether these risks need to be further reduced.

RISK = LIKELIHOOD X CONSEQUENCE

Once the risk has been evaluated, controls need to be developed. Control of risks associated with

hazards shall be implemented using the Hierarchy of Control:



The methodology behind the Hierarchy of Controls is that.

the control methods at the top of the graphic are more effective and protective than those at the bottom. Following the hierarchy normally leads to the implementation of inherently safer systems where the risk of illness or injury has been substantially reduced.

4.4 Energy-Based Safety



1. Energy-Based Safety (EBS) is a proactive approach to identifying, assessing, and controlling hazardous energy sources that have the potential to cause serious injuries or fatalities (SIFs). It complements existing hazard assessment

tools like PJHA and HIERAC and introduces structured methods such as the Energy Wheel, High-Energy Icons, and Safety Classification and Learning (SCL).

2. The Energy Wheel is a visual tool used to prompt hazard recognition across 10 energy types:

- **Gravity** – Falls from height, collapsing excavations
- **Motion** – Moving vehicles, swinging loads
- **Mechanical** – Rotating equipment, tensioned cables
- **Electrical** – Arc flash, energized conductors
- **Pressure** – Hydraulic/pneumatic systems, explosions
- **Sound** – High-decibel environments
- **Radiation** – Welding arcs, lasers, radioactive materials
- **Biological** – Pathogens, insects, contaminated water
- **Chemical** – Toxic vapors, corrosives, flammables
- **Temperature** – Steam, fire, hot/cold surfaces

Workers should use instinct first during PJHA, then consult the Energy Wheel to identify overlooked hazards.

3. High-energy hazards are those exceeding 1500 joules. Common examples include:

- Suspended loads
- Falls from elevation

- Arc flash
- Steam release
- Mobile equipment movement
- Explosions
- Electrical contact
- Fire with sustained fuel source

Use High-Energy Icons to quickly identify these conditions during planning and field verification.

4. Direct controls are safeguards that:

1. Specifically target the energy source
2. Effectively mitigate exposure when installed and verified
3. Remain effective despite unrelated human error

Examples include:

- Lockout/Tagout (LOTO)
- Machine guarding
- Fall protection systems
- Hard physical barriers

Training, signage, and experience are **not** considered direct controls.

5. SCL is a structured model used to classify incidents and learning opportunities. It asks:

- Was high energy present?
- Was there a high-energy incident?
- Was a serious injury sustained?
- Was a direct control present?

Based on responses, incidents are classified as:

- Success
- Capacity
- Exposure
- Low Severity
- PSIF (Potential SIF)
- LSIF (Low-Energy SIF)
- HSIF (High-Energy SIF)

Refer to BM-P33 for full incident communication and management procedures.

6. Supervisors and HSE teams must conduct field verifications using checklists to confirm direct controls are in place. Metrics tracked include:

- % of protected direct controls
- Near misses with SIF potential
- Corrective action strength
- SIF exposure rates

7. All workers must be trained on:

- Energy Wheel use
- High-energy hazard identification
- Direct control implementation
- SCL methodology

Supervisors and managers receive advanced training and are responsible for ensuring documentation is complete and retained per regulatory requirements.

4.5 Public Protection

Consideration for public protection is a critical component of project/job set up.

1. Ensure that restricted/authorized personnel only areas are secure and barricades and/or signage/information is visibly posted.
2. Consider members of the public when completing hazard assessments (including Violence and Harassment Risk Assessments)

4.6 Emergency Response Plans

A complete emergency management system is comprised of four primary components:

prevention/mitigation; preparedness; response; and recovery linked to site-specific HIERAC.

Therefore, site-specific Black & McDonald Emergency Management Plans will have procedures for identifying the potential for and responding to emergency situations, additional planning may be required (i.e. AED, etc.). These management plans will also include methods for preventing and mitigating the health, safety and environmental consequences associated with such situations.

4.7 Site Safety Inspections and Task Observations

To ensure compliance with Black & McDonald's HSE Management System requirements and Regulations/Legislation, task observations and inspections of the work areas must be conducted.

Minimum, frequency targets:

- Regional VP/Sr. VP = 2 Task Observations/month
- RM/DM/GM/AM = 2 Task Observations/month
- PM/PC = 4 site visits per month [minimum: 1 Task Observation; minimum: 1 Site Inspection]
- Field Supervisor = 4 Site Inspections/month
- HSE Manager = 2 Site Inspections/month.
- HSE Advisors = 4 Site Inspections/month.

Note: these requirements may differ based on contract/client requirements.

4.8 Personal Conduct

Black & McDonald is committed to providing a safe, healthy workplace that preserves and enhances the Company's image and reputation of integrity, credibility, and honesty. We believe it is the shared responsibility of all Black & McDonald employees to conduct themselves in an ethical and professional manner.

4.9 Alcohol and Drug

Black & McDonald's commitment to the highest standards of safety in the workplace requires all workers (employees and subcontractors) to always report and remain fit for duties by adhering to the work rules. Workers adversely affected by the use or after-effects of alcohol and drugs can pose a serious health and safety risk to both them and others.

To ensure the safety of all workers, our clients, and the public, along with safeguarding our work environment, the following work rules apply:

1. All workers are expected to always perform their duties in a safe and responsible manner.
2. All workers must report fit for duty, free of any effects or aftereffects of alcohol or drugs; remain fit for duty for the duration of their shift.
3. Prior to beginning work, a worker must notify their manager/supervisor of any adverse effects of alcohol or drugs that could affect their ability to work in a safe and responsible manner.
4. A worker who becomes unfit for duty during their shift must immediately inform their manager/supervisor.
5. The use, possession, or sale of alcohol or drugs by any worker or visitor while in the workplace or while engaged in Company business is prohibited.
6. A worker is not in violation of this policy if:
 - a. The worker is using a prescription or non-prescription drug for its intended purpose and in the manner directed by the worker's physician, pharmacist, or healthcare professional.
 - b. The use of the prescription drug (antibiotics, pain medication, etc.), non-prescription drug (cold/flu medication, allergy

medication, etc.) or authorized substances (medical cannabis) does not impair or otherwise adversely affect the workers fitness for duty and ability to safely perform their duties.

- c. The worker consumes alcohol (professionally staffed/supplied) during approved department or Company social functions. The worker must consume responsibly and assumes full liability for any actions/conduct arising from the consumption of alcohol. In the case of sanctioned Company social events, a safe mode of transportation (taxi, transit, rideshare, etc.) will be made available or reimbursement for transportation will be provided with an appropriate receipt. However, under no circumstances is a worker permitted to drive any vehicle while intoxicated.

Note: Cannabis and cannabis products are prohibited at Company sanctioned social events regardless of its legality.

7. When a position is classified as safety sensitive, under no exceptions will any worker be permitted to perform work while authorized to use medical cannabis as a

form of treatment due to the lack of control over variations in product potency, side effects, and compliance with recommended dosages and frequency of use. The worker must explore other medical options or be moved to a non-safety sensitive position (where available) and where this requirement may be accommodated.

8. Workers who are, or are scheduled to be on-call, are expected to be fit for duty consistent with these work rules throughout the on-call schedule. Any worker requested to perform unscheduled work, which arises due to unexpected circumstances, where the worker's ability to work safely may be adversely affected by the use or after-effects of alcohol and/or drugs must advise their manager/supervisor and refuse the request. A worker who was not scheduled to be at work or on-call prior to such request will not be disciplined for proper refusal of assignment.

See Corporate HR Policy 4.6.03 – Alcohol and Drug

4.10 Anti-Harassment Workplace Violence and Discrimination

Black & McDonald is committed to providing a respectful, fair, safe, and healthy work environment. In pursuit of this goal, the Company will not tolerate or condone discrimination, bullying, racism, harassment, or violence, including acts of threats of sexual

harassment and/or violence.

All employees have a right to a violence and harassment free workplace. No one, regardless of their role in the Company or their affiliation with the Company has the right to discriminate, harass, threaten, bully, or otherwise create a disrespectful work environment.

Employees who violate this policy will be subject to disciplinary action, up to and including suspension of duties or termination of employment.

See Corporate HR Policy 4.3.04 – Anti-Harassment, Workplace Violence, and Discrimination

4.11 Riding on Equipment (Equipment Operators)

No worker shall ride on any piece of equipment unless they are occupying a place or seat designated for such a purpose and are specifically trained to operate that piece of equipment. Workers shall not ride any equipment while it is being transported or floated to another location.

4.12 Horseplay

No worker shall engage in any activity that may be a hazard to co-workers, the public, the work area, or the environment.

4.13 Jewelry

Workers shall not wear any jewelry that may possibly become entangled in tools and equipment being worked on. It cannot be conductive to electrical sources.

4.14 Corrective Action

There are four formal steps of progressive disciplinary action that must be used in the enforcement of the Company policies and working practices. The following disciplinary steps must be recorded on the EIAR Form (Employee Improvement Action Report). HR should be alerted whenever a warning is issued. Refer to the Wire or your HSE Manual.

1. Verbal Warning (Must be documented on EIAR):

Used to deal with the minor initial infractions. It is a verbal statement to the employee that a rule has been violated, an explanation as to why the rule is important, and that in the future, all such rules and work practices must be complied with.

2. Written Warning: An official statement that unacceptable behavior has occurred. The written warning shall state that an employee has committed a violation of rules or working practices, and that further disciplinary action may be taken.

3. Suspension Without Pay: The final warning given to an employee to correct previous behavior prior to discharge. By the suspension, the Company is saying that if the employee commits further violations of the Company policies or working practices, discharge will occur. Full consultation with management is required prior to discharge being initiated.

4. Termination: The final stage of progressive discipline is termination of employment. Termination of employment within the Company may occur following an employee committing

multiple violations of company policy and/or procedures, after the logical steps of progressive disciplinary action have been taken or immediately following severe violation.

See Corporate HR Policy 4-3-05 - Progressive Discipline / Corrective Action

4.15 Subcontractor Management Prequalification

Prequalification is the process of assessing a contractor's health and safety management system and previous performance. This process is an important way to ensure that subcontractors on Black & McDonald sites and projects have the necessary experience and ability to complete the job safely, on time and within budget while meeting or exceeding Black & McDonald and local legislative compliance. Subcontractors shall be requested to enter information on the Black & McDonald subcontractor portal. This information is reviewed by various departments to verify suitability for work. Once approved, the subcontractor is added to the approved listing.

Management

Workers for subcontractors are required to complete an orientation to provide them with information about Black & McDonald's HSE Management System, expectations and potential hazards on the project/site.

They are also required to conduct or participate in hazard assessments prior to beginning work and are required to adhere to all site/project policies, procedures and rules.

Monitoring is an ongoing process and is captured using a Subcontractor Monitoring form available in eCompliance.

Subcontractors are subject to HSE surveillance to ensure they are working in compliance with all Black & McDonald requirements and/or local legislation.

Corrective or disciplinary action may be taken if subcontractors are found to be in contravention of Black & McDonald requirements and/or local legislation.

4.16 Good Catch Program

This program is aimed at recognizing the proactive decisions and actions, made by Black & McDonald employees, subsidiaries, and affiliates, over and above the general safety requirements to further identify and control hazards to people, property and the environment.

HSE Manager/Advisor

- Communicate and encourage the Good Catch program within their region and submit Good Catch forms into eCompliance as required.
- Submit “top 3” Good Catches every month (9 each quarter) to Corporate as required and develop and implement recognition process within the region.
- Review Good Catch submissions and follow up with Good Catch submitters to acknowledge their submission.
- Assist on follow up/corrective actions, where required.

Department Managers/Supervisors/Project Managers

- Encourage and promote the Good Catch program and submit Good Catches into eCompliance during site visits/site inspections/task observations, etc.
- Be involved in the regional recognition of Good Catches.

Workers

- Report Good Catches to direct Supervisor and/or Regional HSE Team



Safe work practices are general guidelines, based on industry best practices, for the performance of a particular type of work or activity.

The purpose of safe work practices is to establish uniform methods of working, to improve the protection of our workers, and to eliminate unnecessary risk to machinery, equipment, personnel, and the environment.

These practices are intended to be the minimum requirement. All practices must be compared to local legislation, with the authority

having jurisdiction, and must always meet or exceed these standards.

In many cases, our clients may have practices already established. In those instances, the more stringent practice will prevail. In all cases it shall be the responsibility of the senior project supervisor to ensure that these practices are implemented and enforced.

The Corporate Safety Committee will annually review safe work practices.

5.1 PERSONAL PROTECTIVE EQUIPMENT

5.1.1 General Rules

1. Workers **must** be trained in proper selection, care and use of PPE and **shall** wear appropriate personal protective equipment as outlined by the most stringent of the Black & McDonald Limited HSE Programs, the client's safety programs or the local authority having jurisdiction.
2. No alterations or modifications **shall** be made to any personal protective equipment (PPE). All equipment **shall** be used as per manufacturers' specifications.
3. Store PPE in its designated location and keep clean and sanitary for use.
4. No drawstrings or loose strings shall be present on the worker's clothing. As it may get tangled with a tool, machine, or any object.
5. Loose hair must be tied back when working around moving equipment and tools.

6. No jewelry or loose clothing shall be worn around moving tools, equipment, or machinery.
7. All PPE **shall** be inspected prior to each use. Any personal protective equipment that is found to be defective, worn, or unsafe **must** be reported and replaced immediately.
8. PPE that is found to be expired, damaged, or in bad working condition shall be removed from the job site and noted in the Supervisors logbook.
9. PPE should be “High Visibility” where applicable.
10. Hooded sweatshirts are not to be worn unless they have the following characteristics and consider the hazard assessment and/or client requirements:
 - a. FR rated material (where required)
 - b. Hood is tucked in, and drawstrings are removed or tucked in.
 - c. Not worn under a hard hat
 - d. Not worn while driving, operating equipment or at any time where they may obstruct peripheral vision.
 - e. Are in good condition

5.1.2 Head Protection

1. Every worker **shall** wear protective headwear at **all** times when on a project or where a hazard is identified by a Pre-Job Hazard Assessment
2. All new workers shall be issued a Black & McDonald hard hat. They shall be Green for Workers, White for Supervisors unless otherwise approved for specific project requirements.
3. The use of hard hats with side impact

protection Type 2 (CSA Z94.1/ANSI Z89.1) is the recommended minimum standard. Requirement to be determined by hazard assessment.

4. All work must be assessed to determine the most appropriate head protection for the task(s).
5. Hard hats are not to be altered, modified, changed, or used in any way other than approved without written consent by the manufacturer and supervisor or as identified by PJHA (i.e., Brim Forward).
 - a. Consists of a shell and suspension that is adequate to protect a person's head against impact and flying or falling objects.
 - b. Has a shell which can withstand a dielectric strength test at 20,000 volts phase to ground (Class E)
6. Hard hats are to be inspected before each use; Defective or expired protective headwear (shell or suspension) is to be immediately tagged and removed from service.
7. Prolonged exposure to direct sunlight may degrade the hard hat shell. Do not store in direct sunlight (including vehicle dashboards) when not in use.
8. No items may be worn under a hard hat unless it is permitted by the manufacturer.
9. Bump caps may be used in situations where hard hats are not required.
10. A welder, on construction sites shall wear an ANSI/CSA approved hardhat with welding shield attached.

11. It is recommended to replace the hard hat suspension and/or shell as per manufacturers guidelines.
12. Hard hats that have been subjected to impact shall be immediately replaced.
13. When chin straps are required by the client, project requirements, or hazard assessment, only chin straps that are manufacturer-approved and compatible with the specific hard hat model shall be used.
14. CChin straps shall not be modified and must be worn as designed (securely fastened under the chin).

5.1.3 Foot Protection

1. At a minimum, workers **shall** wear at all times CSA/ANSI - Certified Grade 1 footwear with heavy-duty toe and sole protection.
2. Boots **shall** be laced to the top. NOTE: Some Regions might have additional Safety Boot requirements (i.e. NO Slip-On safety boots)
3. A hazard assessment and/or client/site specifications will determine if additional requirements for foot protection is needed.
4. Soles **shall** have sufficient tread remaining to prevent slipping.
5. Construction sites shall have, at minimum, 6-inch ankle support.
6. Traction devices (ice cleats, crampons, etc.) may be used in snow or ice conditions. These should only be worn outdoors and removed when inside. They should not be worn on roofs with non-puncture resistant material

On some FMO sites safety shoes are adequate based on the hazard assessment and customer requirements.

5.1.4 Eye/Face Protection

1. Properly fitted, CSA/ANSI approved eye protection **shall** be worn when required in the form of safety glasses and/or spoggles.
2. Prescription glasses are not considered safety glasses unless they are CSA/ANSI approved prescription safety glasses equipped with side shields.
3. Cover goggles/spoggles **shall** be used when drilling into concrete, masonry, and drywall or when using explosive / powder actuated tools.
4. Primary wear **shall** be glasses; Secondary wear may be facing shield.
5. When work activities involve splash hazards, airborne dust, and flying debris, safety goggles/spoggles are recommended.
6. Eye protection is mandatory except in designated areas where PPE is not required.
7. When engaged in grinding, chipping, overhead drilling, buffing, sanding, sawing, soldering overhead, or handling hot or corrosive liquids, the use of a full-face shield with safety glasses or goggles/spoggles is required.
8. A welder **shall** wear a CSA/ANSI approved welding helmet, as this is the only suitable protection against a welding flash. If the welder is being assisted by another worker, this person must also wear an approved welding helmet. Barrier screens must be utilized where possible to

reduce the risk of welding flash exposure to others in proximity.

5.1.5 Hearing Conservation

Continuous exposure to excessive noise from certain construction and/or equipment/machinery activities can lead to hearing loss. Workers **shall** wear hearing protection when exposed to noise greater than 85dB (decibels).

Hearing protection is provided at each site.

Hearing protection is available in three general types:










1. Disposable earplugs
2. Non-disposable earplugs
3. Earmuffs (when properly fitted provide more protection than earplugs)

5.1.6 Respiratory Protection

1. Pre-use inspections **shall** be conducted.
2. No Worker **shall** use a respirator unless they comply with applicable standards & programs.
3. Work areas **shall** be ventilated and/or have a wetting area to reduce hazards from dust, fumes, gases, or vapours.
4. Where ventilation is not adequate, workers **shall** be provided with appropriate respirator protection based on the identified hazard and **shall** be trained to use, fit tested and maintain the respirators properly.
5. Dust Control Tools / Attachments shall be considered and added to tools that produce excessive/hazardous dusts, as appropriate.

5.1.7 Hand/Arm Protection

1. Hand protection, appropriate to the task, **shall** be used at all times on Black & McDonald sites.
2. At a minimum, cut level 3 shall be worn.
3. When working with sharp edges (e.g. ductwork) arm guards, longer gloves, or sleeves should be worn to protect against cuts and lacerations.
4. When selecting gloves consider appropriate sizing. Gloves that are too small may tear, while gloves that are too large affect dexterity.
5. Cut Ratings:

	Nuisance cut hazards
 	Low cut hazards
	Modern cut hazards
 	High cut hazards
  	Extreme cut hazards

6. For additional glove selection guidance, see the QR code at the back of this handbook.

5.1.8 Fall Protection

A fall protection system **shall** be used when a worker is exposed to a risk of falling more than

3m (10ft.) (or less as required by client), when working on an aerial work platform, when working on scaffolds (in accordance with the scaffold tag), where a fall from a height of less than 3m involves a risk of injury greater than the risk of injury from the impact on a flat surface, or any other circumstances dictated by the authority having jurisdiction.

1. All harnesses and lanyards **shall** be CSA/ANSI certified. A pre-use inspection must be conducted by the user before each use and an annual certification by a competent person. For maintenance record purposes a colour coding system is used.

January – December 20236	Yellow
January – December 2027	Purple
January – December 2028	Blue
January – December 2029	Orange
*Pattern repeats	

2. Refer to manufacture specifications for additional recommendations.
3. Full body harnesses **shall** be snug fitting, made of webbing, and **shall** be completely inspected before using.
4. Lanyards **shall** be 16mm (5/8") diameter nylon or Self-Retracting Lanyard (SRL).
5. Ring on safety harness **shall** be in the centre of the shoulders.
6. Lanyard **shall** be connected to a rigid support or lifeline, preferably higher than waist level, and kept as short as possible. When the lanyard is wire, rope or nylon webbing, a shock absorber **shall** be used. Lanyard must be certified as per the manufacturer's specifications.
7. Vertical Lifelines **shall** be:

- a. 16mm (5/8") diameter approved lifeline.
 - b. Used by only one worker at a time.
 - c. Free from any danger of chafing.
 - d. Free of cuts, abrasions, and other defects.
 - e. Long enough to reach the ground, or be terminated, to prevent the hitch from running off the end of the lifeline.
8. Ensure that the anchor points are secure and able to support the load in the event of a fall. A Professional Engineer must approve anchor points.
9. Equipment **must** be removed from service/site once it has been used to arrest a fall or is damaged.
10. A rescue plan is required to retrieve any worker suspended after a fall.
11. Suspension trauma straps should be utilized, whenever possible.
12. All workers required to work at heights shall be trained in the selection, inspection, and use of fall protection equipment.
13. Tools and equipment shall be secured by lanyards or tethers when there is a potential to drop items from height.
14. The area below shall be cordoned off to ensure no one is in the line of fire of any dropped items.

5.1.9 Sunscreen / Skin Protection

1. UVA/UVB skin protection should be used when working outside in sunlight over extended periods of time. On areas of the body such as face, ears, neck and hands, protection from harmful ultraviolet rays of the sun need to be considered.

2. Sunscreen products, readily available in different grades and composition, should be worn when high levels of ultraviolet rays are forecast and when exposure is expected to last longer than 10 minutes.

For persons who are required to wear rubber gloves in their work, consideration must be made for sunscreen products that are not of an oil base, as this type of product will interfere with the protective characteristics of the glove.

5.1.10 High Visibility Clothing

1. High visibility clothing shall be worn where there is low lighting or working around moving vehicles or machinery.
2. Apparel must meet appropriate CSA Z96, or ANSI 107 requirements.
3. A hazard assessment and/or client/site specifications will determine if additional requirements for high visibility clothing is needed.

5.1.11 Donning and Doffing PPE

1. Donning (Putting on PPE) in a specific sequence can maximize protection.
2. When donning (applying) PPE, ensure that you are in a safe area away from potential hazards. Don your PPE in the following sequence:
 - a. **External clothing** such as boots, coveralls (if applicable), high-visibility vest.
 - b. **Masks or respirators** (if applicable)
 - c. **Head protection.**
 - d. **Eye protection.**

- e. **Hand protection.**
3. When doffing (removing) PPE, ensure that you are in a safe area, away from potential hazards. Doff your PPE in the following sequence:
 - a. **Head protection** - Pull up and back on the front brim and away from the face. This ensures that any dust or debris does not fall forward into the face.
 - b. **External clothing** - Items such as coveralls or vests.
 - c. **Hand protection** - Being careful not to touch the outside of the glove.
 - d. **Eye/Face protection** - Pull out and away. Don't pull upwards and dust or debris can fall off the glasses.
 - e. **Respiratory protection** – Leaning slightly forward and pulling the mask away from your face. Do not tip or pull up and over your head.
 4. If any items are disposable, dispose of them immediately and in the appropriate bins. Clean off respirator and store your PPE securely.
 5. Wash your hands thoroughly before putting on PPE and after removing PPE.

5.2 FALL PROTECTION (WORKING AT HEIGHTS)

5.2.1 Guardrails

1. Guardrails consisting of a top rail, mid-rail, and toe board **shall** be provided at all floor openings and edges or roof edges where a worker may have access. A guardrail is not required at a floor opening when protected by a fastened covering.
2. Guardrails are required around the working platform of all scaffolds.
3. Guardrails may only be removed for work to proceed with approval of the supervisor. They **shall** be replaced immediately after work is completed.
4. Reference legislation regarding specific requirements with the authority having jurisdiction.

5.2.2 Elevated Work Platforms

1. A rescue plan **must** be prepared to remove the workers in the event of equipment failure prior to manually lowering the platform.
2. Appropriate Fall Protection **shall** be worn where required by the authority having jurisdiction.
3. An EWP **shall** be inspected before use and operated by a worker instructed in its operation. Any defects are reported, and the EWP is removed from use.
4. An EWP **shall** be used on even, specified surfaces only.
5. An EWP **shall not** bear more than its rated working load.
6. Materials being lifted by the EWP **shall** be secured.
7. Makeshift platforms **shall not** be placed on the EWP platform.

8. Overhanging loads **shall not** be lifted on an EWP platform.
9. An EWP **shall not** be used for pulling, pushing, or dragging materials.
10. Planks or similar platform materials **shall not** be used as a bridge between the EWP and another area.
11. An EWP **shall not** be used in high wind or poor weather conditions.
12. When the EWP is not in use, lower the platform and turn off power.
13. Position the EWP with lower controls accessible in the event of machine failure or rescue operations are required.
14. Only adequately designed EWPs **shall** be used on slopes.
15. When using EWPs with air-filled tires, use stabilizers if provided.
16. Prior to use visually and manually inspect the EWP using a check list.
17. Any worker on an EWP **shall** be tied off to the lift with a CSA/ANSI approved fall protection system.
18. While aloft, the worker **must not** climb from the EWP to another position unless there is a procedure in place that ensures this can be done safely with 100% tie-off.
19. No worker shall work or travel underneath suspended work platform (i.e., work platform, bucket truck etc.)
20. Workers in the bucket must have tools & materials tethered, and all tools and materials should be raised and lowered with ropes or tool buckets. Anything that is being removed or installed must be tethered during installation or removal.
21. Nothing is to be thrown up or down to or from the bucket. The same could be applied in a trench or excavation situation.

22. All workers entering onto an EWP basket are required to be trained in fall protection and on the operation and use of the specific EWP to be used.
23. Workers must always adhere to the manufacturers and operator's guidelines.

5.2.3 Tool Tethering

1. To prevent tools from falling or being dropped they should be tethered or attached to either the operator using the tool, or a fixed anchor point.
2. The weight and size of the tool must be considered when determining where to attach and what type of lanyard shall be connected.
3. Some tools will have built in, factory-designed tethering points while others will require retrofit solutions. Retrofit solutions must be approved tape, rings, or attachment straps.
4. Considerations must be made to the height of the work as higher elevations increase the risk and force of falling tools.
5. Regular and pre-use inspections must be conducted of the tethering equipment to inspect for fraying, weakening, or damage.
6. Workers shall be trained on the proper tethering practices.

5.2.4 Mobile Equipment (Aerial platforms, bucket trucks)

1. All workers **shall** be trained before using mobile equipment.
2. Seatbelts must be worn properly on all powered mobile equipment fitted with rollover protection (ROPS).
3. The vehicle **shall** never be moved if the aerial device is not stowed unless designed

- by the manufacturer to be moved while deployed.
4. During service calls, it is to be the responsibility of the service person to determine if the nature of the work requires a second person to assure safe performance of the work.
 5. While aloft, the worker **shall not** climb from the device to another position unless utilizing emergency self-descent equipment.
 6. Shall have rescue descent kit for bucket truck available.
 7. While aloft, a safety harness **shall** be worn at all times.
 8. SRL for acceptable tie off shall be approved for use or as stated by manufacturer specification.
 9. A hand line long enough to reach the ground when the device is fully extended **shall** be carried in the device.
 10. A 5- or 10-pound ABC fire extinguisher(s) **shall** be kept in the equipment.
 11. A Spill Kit, First Aid Kit, and Eye Wash solution should be present in the equipment.
 12. The wheel chocks **shall** be used at all stops.
 13. All checklists **shall** be completed prior to operation.
 14. Where a vehicle is impeding traffic, proper traffic control procedures **shall** be in place. Please refer to the authority having jurisdiction to ensure compliance.
 15. **Nobody shall** be under the bucket or aerial device. Ensure the operator makes eye contact with anyone below, and checks to confirm nothing is under the bucket prior to lowering.

5.2.5 Rescue Plan

1. All working at heights operations requires the development and implementation of a rescue plan.
2. All affected workers shall be trained on the rescue plan and procedures.
3. At least one designated ground rescue person shall be appointed who knows the rescue procedure and is familiar with the working at heights equipment being used.
4. Designated person shall be readily available during the working at height operations.
5. Personnel on the ground shall undergo familiarization with the emergency plan and all applicable ground and equipment controls.

5.2.6 Scaffolding

1. The erection and dismantling of scaffolds **shall** be conducted under the supervision of a competent person.
2. Scaffolds **shall** be erected with all braces, pins, screw jacks, base plates and other fittings installed as required by the manufacturer or engineer.
3. An inspection and tagging system **must** meet the standards set out by the authority having jurisdiction.
4. No workers are permitted to get on any scaffold unless it is appropriately tagged as required.
5. Workers erecting or dismantling a scaffold more than 2.4 M (8') high **shall** be tied off with an approved fall protection system.

6. Scaffolds **shall** be adequately braced horizontally and vertically as per the local legislative requirements.
7. Scaffolds loads limits **shall** not be exceeded.
8. Scaffolds **shall** be equipped with guardrails, plus toe boards where required as per the authority having jurisdiction.
9. Scaffold platforms **shall** be at least 46 cm (18") wide and if over 2.4 M (8') high **shall** be planked across full width.
10. Scaffolds **shall** be stable and secured either by guy lines or to the building or by using outriggers.
11. Scaffold planks **shall** be secured.
12. Scaffold planks **shall** be of good quality and clean of all foreign objects in accordance with the authority having jurisdiction.
13. Erected scaffolds should be plumb.
14. Scaffolds **shall** be equipped for proper access.
15. Scaffolds over 15 M (50') or 10M in multiple sections **shall** be designed by a professional engineer.
16. Wheels or caster on rolling scaffold **shall** be equipped with braking devices and secured to the frame. Wheels or casters shall be secured prior to working on scaffolding.
17. While erecting and dismantling scaffolds tools shall be tethered or stored securely.
18. Colour coded tags **shall** be affixed to the scaffolds and workers made aware of following info: (a) a green tag with "Safe for Use", or similar wording, to indicate it is safe for use; (b) a yellow tag with "Caution: Potential or Unusual Hazard", or similar wording, to indicate the presence of a potential or unusual hazard; (c) a red tag with "Unsafe for Use", or similar wording, to indicate it is not safe to use.

19. Workers must follow the manufacturers recommendations for scaffolding.

5.2.7 Flat Roofs

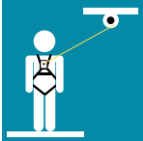
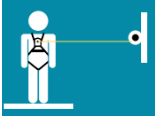
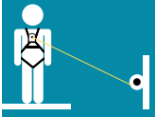
1. Control zones may be used when working on flat roofs, except for structural work and scaffold erection/removal.
2. Control zones shall be established by a barrier consisting of portable weighted posts and taut chain, cable or rope that is located 1.1 metres above the roof level.
3. Control zones must be set back a safe distance of at least two metres (6.5 feet) from the edge, with additional distance if any of the following conditions exist:
 - a. The working surface is slippery
 - b. The work is carried out at an elevation relative to the unguarded edge or;
 - c. The risk is increased by the use of equipment near the control zone.
2. Where a control zone is used, workers may only enter or exit the control zone if they are wearing appropriate fall protection (arrest or restraint).

5.2.8 Fall Calculations

Free fall distance (FFD) and minimum clearance required (MCR) are two important components of the hazard assessment and fall protection plan when performing work at height.

The FFD is the distance from the point where a person falls until the energy absorber begins to slow their fall.

When calculating FFD, the location of the anchor point is important as the calculation formula will change:

<p>Anchor above D-Ring</p> 	$FFD = L - D$
<p>Anchor level with D-Ring</p> 	$FFD = L$
<p>Anchor below D-Ring</p> 	$FFD = L + D$

If the manufacturer's maximum FFD is exceeded, work must not proceed as the equipment is outside of its specifications and limitations. MCR should only be calculated if the FFD is safe and within the manufacturer's specifications.

The minimum clearance required (MCR) is the minimum distance required to safely arrest a person's fall, preventing a fallen worker from coming into contact with obstructions below.

The formula for calculating MCR is:

$$\mathbf{MCR = L + E + D + H + S}$$

MCR = Minimum Clearance Required

L = Lanyard Length

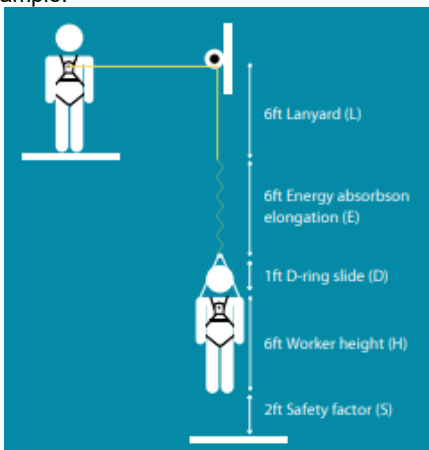
E = Energy absorber elongation

D = D-Ring slide

H = Height of the worker

S = Safety factor

Example:



Note: The values in this image are examples only.

If there is insufficient minimum clearance, work must not proceed until adjustments are made to allow work to be completed safely. Without sufficient clearance, a fallen worker may come into contact with obstructions below.

5.3 LADDERS

All ladders are required to be inspected prior to use to ensure the ladder is in good condition and is the right ladder for the job to be done. For maintenance record purposes a colour coding system is used.

(Colour Codes available in Section 5.4.3 Inspection Tags)

If 3-point, contact cannot be maintained, consider the use of Platform Ladders (SWP 5.3.3). If not, then a CSA approved Fall Protection System shall be worn when a worker is exposed to a fall of greater than 3M (10ft) while working on an extension ladder.

5.3.1 Stepladder

Stepladders are to be used only on clean, even, firm, and stable surfaces.

1. Manufacturers guidelines shall be followed.
2. Ladders shall be wood or fiberglass only.
3. No work is to be done from the top step of a stepladder; **the top platform is not a step.**
4. The stepladder is only to be used in the fully opened position with the spreader bars locked.
5. Tops of stepladders are not to be used as a support for scaffolds.
6. Do not overreach while on the ladder. Climb down and move the ladder over to a new position. There should only be one person on a ladder at any time.
7. Only CSA/ANSI approved ladders **shall** be used.

8. Select the proper ladder for the task. It **shall** be equipped with safety feet suitable for the surface on which they will be used.
9. Inspect the ladder before use. Ladders with broken rungs, split side rails, work or broken safety feet must be immediately removed from use, tagged, and either repaired or destroyed.
10. Ladders **shall not** be erected on boxes, carts, tables, scaffold platforms, elevated work platforms or on vehicles.
11. Unless suitable barricades have been erected or other adequate protection provided, ladders **shall** not be set up in passageways, doorways, driveways, or other locations where they can be struck or bumped by persons or vehicles.
12. Only non-conductive ladders **shall** be used in the proximity of energized electrical conductors.
13. Always face the ladder when climbing up or down and maintain three points of contact.

5.3.2 Extension Ladder

1. Manufacturers guidelines shall be followed.
2. All extension ladders **shall** be equipped with non-slip bases.
3. Ladders **shall** be set up on a stable and firm level surface.
4. Extension ladders **shall** be secured to prevent movement.
5. When a task **shall** be done while standing on an extension ladder, the length of the ladder should be such that the worker stands on a rung no higher than the fourth from the top.
6. When climbing up or down, workers **shall** always face the ladder.

7. Unless suitable barricades have been erected or other adequate protection provided, ladders **shall not** be set up in passageways, doorways, driveways, or other locations where they can be struck or bumped by persons or vehicles.
8. Ladders **shall not** be erected on boxes, carts, tables, scaffold platforms, elevated work platforms, or vehicles.
9. Straight ladders **shall** be set up at an angle such that the horizontal distance between the base and top support is not less than one-quarter (1/4) or greater than one-third (1/3) the height between those two points.
10. Only non-conductive ladders **shall** be used in the proximity of energized electrical conductors.
11. Wooden ladders **shall not** be painted, but finished with a clear, non-conducting wood preservative.
12. All ladders erected between levels or erected to access a roof or platform **shall** be securely fastened, extend 90 cm (3') above the top landing, and afford clear access at top and bottom.
13. Defective ladders **shall not** be used and **shall** be tagged and removed from service.
14. Ladders **shall not** be used horizontally.
15. Workers on a ladder **shall not** straddle the space between a ladder and another object.
16. Three points of contact **shall** always be maintained when climbing up or down a ladder (two feet and one hand or one foot and two hands).

5.3.3 Platform Ladder/Rolling Ladder

1. Always ensure that platform ladders are properly set up and used in accordance with the safety instructions that can be

found on the ladders label.

2. Prior to use, platform ladders should be inspected. Look for signs of damage and/or worn parts. Make sure that the ladder is free of slipping hazards (grease, oil, paint, water, etc.).
3. Ensure the platform ladder is positioned on firm, dry, level ground and that all feet have firm contact with the ground. The ladder should not exhibit any rocking motions.
4. When ascending or descending platform ladders, do so one step at a time.
5. Only one person should be on a platform ladder at a time.
6. Position the platform ladder within arms reach (or closer) to the task at hand. Do not attempt to overreach.

5.4 CRANE AND RIGGING OPERATIONS

5.4.1 Rigging

1. Hoisting, Rigging & Lifting devices **shall** only be operated by competent workers.
2. Manufacturers guidelines for all rigging equipment shall be followed.
3. A safe lifting plan is required if the task is considered a Critical Lift based on initial hazard identification.

Critical Lift is defined as: A lift in which one or more of the following applies: exceeds 75 percent of the rated capacity of the crane or derrick, requires the use of more than one crane or derrick, the center of gravity of the load, the length of one or more sling legs changes during a lift, a lift over or between energized electrical conductors, submerged load or a lift in which a suspended personnel platform is utilized to hoist personnel.

4. Pre-use inspection, annual inspections and maintenance records must be retained and available for each component.
5. A colour coding system is recommended to keep record of maintenance. (Each region may establish their own colour scheme if needed or other requirements; *refer to section 5.4.3 Inspection Tags for colour codes*).
6. **Working Load Limits (WLL)**, rated load capacity **shall** be present and legible on the rigging components.
7. Label(s) **shall** be affixed to equipment showing rated load capacity and manufacturer's information.
8. Hooks must be provided with functional

safety latches.

9. Know the limitations of the lifting device.
10. Determine the center of gravity of the load.
11. Equalize load on multiple leg slings.
12. Lift loads a few inches and check rigging components for shifting, etc.
13. Start and stop the lift slowly. Always prevent shock loads.
14. Determine load weight before rigging it.
15. Never exceed the safe working loads of slings and rigging hardware, as noted on equipment.
16. Do not use defective hardware and tackle. If found to be defective notify your supervisor in order to tag and remove from service for repair/replacement.
17. Keep wire rope and nylon slings away from cutting and welding operations.
18. When affixing inspection tags to rigging equipment, ensure that it does not potentially or actually puncture, cut or damage the webbing.
19. Rig loads to prevent them from loosening or coming apart.
20. Use appropriate length taglines to guide heavy or awkward loads.
21. Stand clear when loads are being lifted or lowered, and when slings are being pulled out from under the load.
22. Do not hoist loads over any person.
23. Avoid hoisting in high winds or in poor visibility.
24. Always look overhead for power lines. Maintain minimum clearances from overhead power lines as dictated by the authority having jurisdiction.

25. Communication between crane operators and workers should always be clear, concise, and sent by a competent signal person. A signal person is mandatory if the operator has any obstructed view.

5.4.2 Attaching Cable Clips & Clamping

1. Never operate rigging devices unless you have been trained.
2. Name one member of the crew that is competent and has been trained in signalling to function as a signal person and instruct the equipment operator to recognize signals from that person only. The signal person shall be careful not to order a move until they have received the “**all ready**” signal from each member of the crew. Identify the signal person using distinctive vests, armbands, etc. The signal person is not to perform any other tasks while acting as a signal person.
3. Each rigger **shall** be sure they’re in the clear before they give an “**all ready**” to the signal person. When you have positioned the sling or choker you’re using, release it, if possible, before you give the “all ready” signal.
4. If you must hold the sling or choker in position, be sure your hand is clear of pinch points.
5. Always inspect slings and chokers for frays, tears, and poor repair. Tag and remove or repair all slings or chokers that are found to be in poor condition.
6. Watch out for the roll or swing of the load. Since it’s almost impossible to position the hook exactly over the load center, there will almost always be a swing or roll.

- Anticipate the direction of the swing or roll and work away from it.
7. When lowering or setting the load, be sure your feet and all other parts of your body are out from under. Set the load down easily and slowly so that if it rolls on the blocking, it will be a slow shift that you can get away from.
 8. Never place yourself or any body parts between material, equipment or any stationary object and the load swing.
 9. Never stand under the load and keep out from under the boom as much as possible.
 10. Look over the place where the load is to be set. Remove unnecessary blocks or other objects that might fly up if struck by the load.
 11. Stay away from stacked material that may be knocked over by a swinging load.
















5.4.3 Inspection Tags









The tags will be coloured to match the chart below:

January – December 2026	Yellow
January – December 2027	Purple
January – December 2028	Blue
January – December 2029	Orange
*Pattern repeats	

5.4.4 Hoisting Signals

Prior to work being conducted a communication plan between the signaller and the crane operator shall be determined and confirmed. This plan shall also be included in the Pre-Job Hazard Assessment and Lifting Plan.

<p>Load Up</p>  <p>1</p>	<p>Load Down</p>  <p>2</p>	<p>Load Up Slowly</p>  <p>3</p>
<p>Load Down Slowly</p>  <p>4</p>	<p>Boom Up</p>  <p>5</p>	<p>Boom Down</p>  <p>6</p>
<p>Boom Up Slowly</p>  <p>7</p>	<p>Boom Down Slowly</p>  <p>8</p>	<p>Boom Up Load Down</p>  <p>9</p>
<p>Boom Down Load Up</p>  <p>10</p>	<p>Everything Slowly</p>  <p>11</p>	<p>Use Whip Line</p>  <p>12</p>
<p>Use Main Line</p>  <p>13</p>	<p>Travel Forward</p>  <p>14</p>	<p>Turn Right</p>  <p>15</p>

<p>Turn Left</p>  <p>16</p>	<p>Shorten Hydraulic Boom</p>  <p>17</p>	<p>Extend Hydraulic Boom</p>  <p>18</p>
<p>Swing Load</p>  <p>19</p>	<p>Stop</p>  <p>20</p>	<p>Close Clam</p>  <p>21</p>
<p>Open Clam</p>  <p>22</p>	<p>Dog Everything</p>  <p>23</p>	<p>NO RESPONSE SHOULD BE MADE TO UNCLEAR SIGNALS</p> <p>24</p>

5.4.5 Cable Clips and Clamping

A competent worker will wire the thimble to the rope at the desired point, then bend the rope around the thimble and secure temporarily by wiring the rope members together.

First, attach the clip farthest from the thimble and tighten (**be sure the base of the saddle rests upon the live end of the rope and the "U" bolts on the short end**).

All clips shall be attached in this manner. The clip nearest the thimble goes on next. Do not tighten yet. If one or more additional clips are to be attached, place them at an equal distance apart between the clips already attached.

Before tightening, place some stress on the rope to take up the slack and equalize the tension on both sides of the clip. (Do not apply too much stress or the clip attached in Step 1 will not hold.) Tighten all clips.

<i>Diameter of Rope (mm)</i>	<i># Of Clips</i>	<i>Spacing Between Clips Centre to Centre (mm)</i>	<i>Torque (NM)</i>
6	2	38	20
8	2	51	40
10	2	57	65
11	2	64	90
12	3	76	90
16	3	102	135
19	4	114	176
22	4	133	305
25	4	152	305
29	5	178	305
32	5	203	488
38	6	229	488
44	7	267	628
50	8	305	881

5.4.6 Common Knots & Hitches



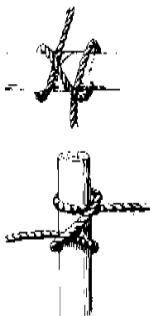
Square or Reef Knot

Used for joining two ropes of the same diameter. The Reef Knot is secure, yet easily untied when either free end is jerked.





Round Turn and Two Half Hitches


This knot is used to secure a rope to a column or post. It is easily tied, will not jam, and can withstand strain without slipping.

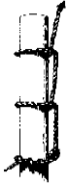



Clove Hitch

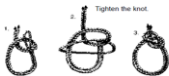
The Clove Hitch is a quick and simple method of fastening a rope to a pipe or a post. It can be tied using the end of the middle of the rope. The Clove Hitch is often used in connection with the Half Hitch.

 <p data-bbox="246 343 468 368">Single Sheet Bend</p>  <p data-bbox="236 534 468 558">Double Sheet Bend</p>	<p data-bbox="588 142 768 170">Sheet Bend</p> <p data-bbox="588 177 872 350">Used for joining ropes of different diameters. More secure than a Reef Knot.</p>
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	<p data-bbox="499 680 799 708">Basic Timber Hitch</p> <p data-bbox="499 715 789 743">At least three turns.</p>
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	<p data-bbox="499 923 847 986">Timber Hitch and Two Half Hitches</p> <p data-bbox="499 992 816 1131">This knot is useful for hoisting planks, timbers, and pipe. It does not jar or slip.</p>
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	<p data-bbox="499 1236 629 1263">Bowline</p> <p data-bbox="499 1270 851 1444">A favourite knot amongst riggers; it is easily tied and does not slip, jam, or fail, as long as it is tied properly.</p> <p data-bbox="499 1489 847 1583">Hold the standing part in the left hand. With the right hand, make an</p>
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overhand loop in front of the standing part. Hold with the left thumb and forefinger. Take the running end in the right hand.

Pass up through the loop, behind the standing part, and down through the loop in the other side.

Tighten the knot.

Bowline on the Bight

Used in making up a set of double-leg spreaders. Begin as an ordinary Bowline, using two parts of the rope. After passing bight through loop, open it up and slip it over the entire loop.

5.4.7 Tag Lines

1. Taglines should be used on all loads that may swing or spin, unless they serve no purpose or would create additional hazards.
2. Tag lines should be used to:
 - Assist in control of any swing induced by lifting the load
 - Alter the rotational attitude of a suspended load as it's guided along a path or to position the load in a particular orientation.
 - Counteract the uncontrolled rotation of a freely suspended load as it is lifted and maneuvered.

- Help stabilize the load when enabling personnel to maintain a safe distance from the load.
2. Tag lines should NOT be used for:
 - Pulling the load out of its natural plumb suspended line.
 - Induce recovery or pay out of the load line.
 - Contribute to supporting the load.
 - Lash or drag a load and should never be wrapped or tied around a person or any fixed point.
 3. Tag lines should not be used if they create a safety hazard. Instances such as: causing the handler to be placed near a pinch point or in a position where they could become crushed by the load, there is not a clear path of travel for the handler to be able to walk through without trip hazards or without causing potential snagging hazards, when the loads rotation is excessive and cannot physically be controlled via tag lines, and where there is not enough clearance for the handler to keep out of the fall zone.
 4. Before making the determination not to use a tagline, be sure to fully assess the operation with the lifting team. If a tag line is necessary for positioning or load control, but creates additional hazards, it is important to consider alternatives such as a push/pull pole.
 5. Things to consider when using a tag line during lifting operations:
 - wind speed increases with height

- possible wind funneling effects
 - size/shape/weight of the load
 - clearances between the load and the crane, line, structures, etc.,
 - ability to locate and pass over tag lines
 - capability of the tag line operator/rigger to maintain adequate position and control of the load during the lift.
6. Tag lines should be long enough to keep you a safe distance from the load and long enough to reach and move to the manipulation without compromising user safety.

5.5 CONFINED SPACE

Confined space means a fully or partially enclosed space:

- a) That is not designed and constructed for continuous human occupancy, and
- b) has a limited or restricted means of entry or exit, or a configuration that can complicate first aid, rescue, evacuation, or other emergency response activities.

If you have a space that is fully or partially enclosed, the two conditions – (a) and (b) above – must both apply before the space can be considered a confined space.

1. Refer to the Black & McDonald Standards for the required entry permit form and the details related to confined space as well as local legislation for requirements based on job/task.
2. An assessment **shall** be completed in writing by a competent worker trained in gas detection prior to commencing any confined space work, refer to the authority having jurisdiction.
3. When the hazard assessment findings demonstrate an unsafe environment, written controls **shall** be implemented to correct the hazardous situation within the confined space. The confined space **shall** be re-tested after each hazard has been eliminated.
4. The written report **shall** stay on the site of the confined space until the work in the area is completed.
5. Rescue procedures **must** be documented and presented to workers on site.
6. Where possible, mechanical venting **shall** be set in place. The space **shall** be

- continuously monitored or ventilated while workers are in the confined space.
7. All workers working in a confined space **shall** wear a lifeline unless other emergency rescue procedures are completed and reviewed by all workers. There **shall** be, at all times, a competent worker posted at the entrance, prepared, and equipped to provide assistance if required.
 8. The worker posted at the entrance **shall** be certified in First Aid, CPR, and Emergency Evacuation Procedures.

5.5.1 Gas Monitoring

1. Before a competent worker enters into a confined space various gas testing must be conducted. These tests include:
 - a. Oxygen content
 - b. Flammable gases and vapours
 - c. Potential toxic air contaminants
2. If a hazardous atmosphere is detected, the employees must leave the space immediately.
3. Continuous monitoring must be done where atmospheric conditions have the potential to change (e.g., broken, or leaking pipes, work activities create hazardous environment, isolation of a substance is not possible).
4. Gas monitors and testing equipment must be calibrated, and bump tested prior to its use by a competent person.
5. Results of atmospheric testing must be recorded on the Confined Space Entry permit, along with the equipment and

- method(s) used for performing tests.
6. If mechanical ventilation is required, a warning system shall be in place to notify the worker in the event of a hazard and/or the failure of the ventilation equipment.
 7. If mechanical ventilation is required, its use shall be noted on the Confined Space Entry Permit.
 8. Ensure that air being removed from the confined space is exhausted away from workers on the outside.
 9. Do not substitute oxygen for fresh air. Increasing oxygen content will significantly increase the risk of fire and/or explosion.

5.5.2 Confined Space Permit

The purpose of a Confined Space Entry Permit is to communicate to workers the hazards that have been identified and the controls that are in place.

1. A separate entry permit is to be issued each time work is to be performed in a confined space and before any worker enters into a confined space.
2. The permit must be readily available to every person involved in the confined space entry.
3. The contents of the permit include:
 - a. Location of confined space
 - b. Description of work to be performed.
 - c. Description of hazards and corresponding controls
 - d. Time period for which the permit applies.

- e. Name of the attendant
- f. Record of each worker's entry and exit
- g. List of equipment required for entry and rescue; and verification that it has been inspected and in good working order.
- h. Results obtained in atmospheric testing.

5.5.3 Confined Space Rescue Plan

If a situation arises where there is a hazardous condition and the worker does not leave or is unable to leave the confined space, rescue procedures should begin immediately.

1. A trained competent Rescue Attendant shall be available immediately outside the confined space to monitor the work and initiate rescue procedures. The Attendant must remain outside the confined space at all times and may perform non-entry rescue only if trained and competent. The attendant shall be in constant communication with the worker inside the confined space ensure all non-entry rescue equipment is immediately available and ready for use.
2. The Attendant shall be trained in confined space hazards, non-entry rescue procedures, retrieval equipment, and First Aid/CPR. Entry rescue shall only be performed by a designated, trained Rescue Team when non-entry rescue is not possible.

5.6 ELECTRICAL SAFETY

5.6.1 MANAGING HAZARDOUS ENERGY

5.6.1.1 Lockout & Tag Out Procedures

Lockout / Tagout procedures are an important requirement during any activity when a piece of equipment or system represents a potential hazard to life or property. All workers **must** receive training including how to identify hazardous energy, correctly use lockout/tagout and isolation methods, follow rules for restarting equipment, and apply or remove locks/tags safely.

1. The minimum procedure is that of existing codes, statutes, or manufacturers' specification. The most stringent of the instructions, rules, or regulations apply with respect to tagging and lockout procedures.
2. Workers **shall** follow written job procedures for Lockout / Tagout as directed by their supervisor or as outlined in Black & McDonald's standards and Lockout Tagout Form.
3. All energy sources must be locked out/turned off/released and the worker must use their own lock and tag on each energy control point when performing maintenance.
4. "No energy" must be verified after locking out.
5. Procedures must be adhered to before equipment start up or use and in cases where a worker's lock must be removed.
6. Maintenance on operational equipment is **Not Permitted**.

5.6.1.2 General Electrical

1. No electrical work **shall** commence unless authorized.
2. **Disconnect power** before working on any electrical equipment.
3. When it is absolutely necessary to work on or near live (energized) circuits an approved site and task specific procedure is required. Also, a second competent worker shall be in attendance.
4. Fuse Pullers and Gloves (appropriately rated) shall be used to insert or extract fuses.
5. When working in close proximity to overhead power lines, maintain minimum clearances from the power lines as dictated by the legislation for the region in which you are working.
6. Electrical equipment and lines **shall** always be considered as live. Always test, isolate, and ground.
7. When work is being done on or near live exposed parts of installations, equipment, or conductors' workers **shall** wear required arc rated personal protective equipment and have a written procedure in place to protect them from electric shock and arc flash burns. Refer to Black & McDonald's Standards for further information. **Note: Hot work permits are not required when the work consist only of diagnostic testing of equipment installation or conductor.**
8. Any equipment with capacity to conduct electricity **shall** not be used in close proximity to any live electrical installation or equipment.
9. No worker **shall** open or close any circuit unless he / she is thoroughly familiar and

- has full knowledge concerning the circuits affected and giving ample warning to other workers who may be endangered.
10. The worker **shall** stand on the opposite side to the hinge of a switch box when opening or closing a circuit.
 11. When the worker is splicing into a de-energized circuit, finish the first joint including insulation before starting the second.
 12. Do not work on conductors without knowledge of their voltage.
 13. Do not depend on the insulating cover of wires.
 14. The worker **shall** never use steel tape measures near energized systems.
 15. Never wear jewelry or other metal objects while working on energized systems. This includes metal frame eyeglasses.
 16. Equipment **shall** be megger-tested upon completion of work before re-closing.
 17. Portable electrical tools **shall** be effectively grounded and protected or be of “double-insulated” construction.
 18. The casing and frame of portable electric generators **shall** be effectively grounded.

5.6.2 ELECTRICAL UTILITY

5.6.2.1 Working Alone

1. Except for the purpose of replacing fuses or operating switches using approved tools and protective equipment, no worker **shall** be permitted to work alone on an apparatus energized at more than 750 volts phase-to-phase where the worker may be exposed to electrical contact.
2. In accordance with the above, when a second person is required that person **shall** be suitably equipped and competent to affect a rescue. This worker **must** have successfully completed the second year of a formal lineman apprentice training or equivalent.

5.6.2.2 Handling Energized Conductors

Workers **shall** not handle energized conductors unless they are competent, and adequate protective devices are used. Nor will they use tools or equipment with electrically conductive capabilities near any type of live electrical equipment or installation.

5.6.2.3 Personal Protective Equipment and Devices

1. Protective clothing, equipment and devices **shall** comply with requirements and **shall** be used / worn as per manufacturer's specifications.
2. Appropriately rated gloves **shall** meet CSA standards Z259.4-M1979/ANSI standard J6.1967 and **shall**:
 - a. Be stored and maintained in a serviceable condition.

- b. Never be worn inside out or without leather protectors.
 - c. Be lab-tested at the time periods stipulated in your local legislation (CSA mandates every 6 months).
 - d. Be exchanged when worn or damaged.
 - e. Be visually inspected immediately prior to use.
3. Live Line Work:
- a. Two or more conductors **shall not** be worked on simultaneously.
 - b. When connecting or disconnecting conductors of the same phase or polarity, an approved pickup load break, or other approved live line tool, **shall** be used to remove the worker from the flash area, unless it has been determined that no flash hazard exists.
 - c. All conductors or attachments that can create an electrical hazard **shall** be covered with protective equipment of the proper voltage rating.

5.6.2.4 Hardware

1. Loosen pole hardware from the bottom up.
2. Do not loosen all pole hardware simultaneously.

5.6.2.5 Live Line Tools

1. Only trained workers **shall** use such tools.
2. At least two competent workers **shall** be together when working with such tools.
3. Live line tool operation **shall** be with a hold-off permit.

4. When using live line tools, no other work **shall** be conducted on the pole or structure.
5. All work **shall** be conducted under the supervision of a competent supervisor.
6. Care **shall** be taken of these tools, so their insulating properties are preserved.
7. Synthetic fiber tools **shall** be tested at the interval determined by the authority having jurisdiction.

Live Line Tools & Protective Equipment Electrical Retesting Requirements

Minimum Test Voltage	=	Normal Design Voltage	+	2,000 Volts	+	0.05 Maximum Retest Voltage	
Equipment		Initial Test Voltage (A.C.) (3 min.)		Maximum Use Voltage (A.C.) Phase To Phase		Maximum Retest Voltage (A.C.) (1 min.)	Test Interval
Rubber Gloves and Sleeves							
Class 0		5,000		1,000		5,000	See Local Legislation.
Class 1		10,000		7,500		10,000	
Class 2		20,000		17,000		20,000	
Class 3		30,000		26,500		30,000	
Class 4		40,000		36,000		40,000	
Blankets, Covers, Couplers, Line Hoses, Hoods							
Class 0		5,000		1,000		5,000	yearly
Class 1		10,000		7,500		10,000	yearly
Class 2		20,000		17,000		20,000	yearly
Class 4		40,000		36,000		40,000	yearly
By Pass Jumpers							
15 kV		31,000		17,000		31,000	yearly
35 kV		40,000(1 min.)		36,200		40,000	yearly
Insulated Pole Platforms							
0.91 m (3 ft.)		100,000				100,000	yearly
1.2 m (4 ft.)		100,000				100,000	yearly
1.83 m (6 ft.)		100,000				100,000	yearly
Bucket Liners		50,000				50,000	yearly
Live Line Tools		100,000				100,000	3 years
Fiber Protective Equipment							
Class 2		13,000				13,000	yearly
Class 4		32,000				32,000	yearly
Class 5		42,000				42,000	yearly

5.6.2.6 Climbing and Working Aloft

1. The worker **shall** not wear climbing spurs except for their specific purpose.
2. The gaff on the spurs **must** never be less than 3.17 cm (1 1/4") measured from the inside of the gaff.
3. Workers **shall** never work aloft without being secured with a fall protection device.
4. Suitable work clothing, including a long-sleeved shirt or jacket fastened at the wrist, **shall** be worn when working aloft.
5. Tools and materials **shall** never be thrown to or from the workers working aloft. Tool bags or hand line **shall** be used.
6. Tool lanyards may also be required where applicable.
7. Never lay tools where they may fall to the ground.
8. All poles **shall** be inspected before climbing to ensure they are safe. If in doubt, consult your supervisor.
9. Under no circumstances **shall** pike poles be used to support a pole where a worker is required to work.
10. Whenever practical, work from below existing conductors rather than above.
11. Area below work zone shall be barricaded off.
12. Workers working aloft shall ensure that pockets are empty, and do not contain anything that could create an impalement hazard.

5.6.2.7 Groundwork

1. Under no circumstances **shall** work be conducted on the ground that might present a hazard to the worker working aloft.

2. No work, unless absolutely necessary, **shall** be permitted on the ground in the immediate vicinity of the pole due to hazard of falling objects.

5.6.2.8 Potential Testing

1. Only suitable devices **shall** be used to test for electrical potential.
2. Potential testers **shall** be tested by a recognized organization yearly.

5.6.2.9 Working on De-Energized Lines

1. Temporary grounding devices **shall** be placed on conductors between the work location and all possible sources of electrical energy.
2. Temporary grounding devices **shall** be installed with a live line tool only after potential tests have been completed to ensure that conductors being worked on are isolated.
3. Temporary grounding devices **shall** be placed so that they may be readily visible to at least one worker at all times.
4. Temporary grounding devices **shall** be connected to a low resistance ground before being brought in contact with any isolated conductor of the circuit to be grounded. The grounding device **shall** be removed from all circuit conductors before disconnecting from ground.

5.6.2.10 Street Light Circuits

1. All wires necessary for the operation of streetlights **shall** be treated as live unless isolated and de-energized.
2. When work is to be conducted on a series of street lighting or airport lighting circuits, the same precautions in opening switches

shall be carried out as when working on any high voltage circuit.

5.6.2.11 Boom, Cables, and Conductive Materials

1. Steel cables or metal booms **shall not** be used to raise transformers, poles, or material near high voltage lines except:
 - a. When the cable or boom is rigged below energized conductors a sufficient distance to prevent the possibility of electrical contact between such wires and the cable boom or conductive material being raised.
 - b. When the vehicle or cable is adequately grounded and where all members of the crew are using appropriately rated gloves and other protective devices and approved live line techniques.

A formal procedure shall be written to ensure that all hazards have been identified and minimized.

2. Boom trucks used for hoisting **shall** be operated within the manufacturers' safe load limits.
3. Cranes or radial boom derricks used in proximity to energize conductors for other purposes than live line techniques **by certified linesmen, shall** be operated in accordance with Safe Limits of Approach legislated in the local area where the work is being performed.
4. A competent signal person **shall** be appointed to function as a dedicated observer and signal the operator

whenever the equipment approaches the legislated Safe Limits of Approach.

5. Consult local legislation for the region in which you are working to confirm clearances.

5.6.2.12 Electric Power Tools Employed Aloft

1. Electric power tools **shall not** be used aloft until a safe work area has been established.
2. At no time **shall** tools or extension cords be used in a position above any component energized at a higher voltage level than that required to operate the tool.

5.6.2.13 Stringing and Removing Wire

1. During stringing, adequate grounding techniques **shall** be used under the supervision of a competent person.
2. When wire is being strung over streets or thoroughfares, workers equipped with warning devices **shall** be stationed at suitable locations and, when necessary, control traffic using the proper traffic control signals.
3. Appropriately rated rubber gloves **shall** be used when stringing or removing wires unless other suitable precautions are taken to protect workers and the public from accidental contact with energized conductors (i.e., equip potential zone around reels by bonded ground and gradient mat for operator, protected by a full fence).
4. Effective communication **shall** be set up for the crew.

5. When stringing or removing wires near energized lines, insulated guards **shall** be used.
6. Workers **shall** stay clear of all wires and ropes under tension.

5.6.2.14 Pole Handling and Transportation

1. The transportation of poles **shall** be conducted in accordance with all existing traffic legislation.
2. Only approved methods, tools and equipment **shall** be used to handle poles.
3. Workers and equipment **shall** be positioned to minimize the danger of injury or damage when handling poles.
4. Pole piles **shall** be secured with proper tie downs, chains, or cables.
5. Workers **shall not** ride on piles of poles, trailers, or dollies.

5.6.2.15 Ratchet Hoists and Rope Blocks

1. Metal ratchet hoists **shall not** be used on or near energized lines.
2. Web hoists and rope blocks **shall not** be considered as insulated on voltages in excess of 750 volts.

5.6.2.16 Capacitors

1. Where applicable, signs designating “capacitors” installed **shall** be placed at service entrance location on poles or structures.

5.6.2.16 Open Water

1. Workers **shall** wear approved personal flotation device and a lifeline when working on dams, along canals, docks, and other structures near open water.

2. A rescue plan **must be** developed before performing any work. Refer to local legislation for further requirements.

5.6.2.17 Working with Overhead Powerlines

1. Development of written procedures is required prior to work commencing.
2. Use a signaller to direct equipment operators and truck drivers. The signaller must be in full view of the operator and have a clear view of the powerline.
3. The signaller must warn drivers and operators when any part of their equipment or load approaches the minimum distances set by law.
4. When erecting or moving a ladder or scaffold, do not let it lean or drift towards overhead powerlines. Always maintain minimum allowable clearances.
5. Minimum distances may vary by jurisdiction. Refer to local legislation/regulations.

5.7 UNDERGROUND DISTRIBUTION AND TRANSMISSION

5.7.1 Working on Cables and Apparatus

1. Ensure proper cables or apparatus are identified where work is to be conducted.
2. Isolating points **must** be provided.
3. Temporary grounding devices are to be installed.
4. No work **shall** be conducted on de-energized underground cables until protective devices are in place to prevent contact with adjacent energized conductors.
5. Identification:
 - a. Identification of cables **shall** be established before cable is cut.
 - b. Identification **shall** include testing and marking cable to be cut.
 - c. Verification by second competent electrical worker **shall** be conducted prior to cable being cut.
 - d. A cable spiking gun or device may be used to ensure positive identification before a cable is cut.
 - e. Wherever practical, the spiking gun or device **shall** be operated from outside the work area.

5.7.2 Moving Energized Cables

When moving energized cables, workers **shall**:

1. Be competent in the moving of such cables. Any cables over 750V phase-to-phase **shall** be moved under the direction of the supervisor.

2. Proper appropriately rated rubber gloves **shall** be worn, and specific procedures followed.
3. Assure no physical pressure is applied to the cable or separated connector that will cause any movement, distortion, or dislocation on the connector.
4. Only one conductor **shall** be moved at a time.
5. All precautions **shall** be taken not to make contact with other cables or metal parts in the work area.

5.7.3 Pulling Cables

1. Cables **shall not** be pulled into vaults or a utility access hole containing energized apparatus until a safe work area has been established.
2. Ducts **shall** be fished, or cables pulled in the direction that presents the least hazard. Precautions **shall** be taken when compressed air or other mechanical means are used.
3. Workers, except for training cables into position, are to stand outside vaults or utility access holes when cables are being pulled by mechanical means and are under tension.
4. Wire rope **shall not** be used to pull cable in a duct already occupied by cables.
5. Cables **shall** be pulled using only approved cable pulling equipment.
6. Open utility access holes shall have guardrails or delineated with warning tape it to prevent falls.
7. Open utility access holes shall be securely covered when not in use.

8. Cable tuggers shall be anchored only to rated structural points. Do not anchor to conduit, racking, or handrails.
9. A dedicated spotter shall monitor the tugger, rope path, and entry point at all times.
10. Workers shall stay clear of the rope path and never stand in line with the pulling tension.
11. Only one designated worker shall give the "pull" command.
12. Effective communication (radio or hand signals) shall be established before the pull.
13. Pulling equipment (rope, grips, sheaves, rollers) shall be inspected for damage before use.
14. The operator shall use slow, controlled speeds, especially through bends, and stop immediately if tension spikes or the cable stalls.
15. Manufacturer's maximum pulling tension shall be confirmed before starting.
16. Hands shall be kept clear of pinch points at rollers, conduit entries, and rotating drums.
17. Reels shall be placed on level, chocked surfaces and cable shall be fed by pushing, not pulling.

5.7.4 Handling of Heating Materials

1. Thermal protection work gloves **shall** be worn while heating or handling hot insulating compounds and solder pots.
2. When heating insulating compounds in containers, the containers **shall** be opened, and the sides preheated from top to bottom to form a vent before placing in

- a furnace. Care **shall** be taken not to splash the insulating compound.
3. Utility access holes:
 - a. Precaution **shall** be taken to prevent solder pots from tipping or falling into the opening of a utility access hole.
 - b. Workers working in a utility access hole **shall** be warned when hot material is being lowered into the utility access hole.
 - c. Workers in a utility access hole **must** be ready to receive before the lowering can start.
 - d. Propane tanks **shall not** be lowered into a utility access hole or vault.
 - e. Tanks **shall** be secured to prevent falling into the utility access hole.
 - f. Hand-held, liquefied petroleum gas appliances are permitted in a utility access hole or vault providing the supply tank is an integral part of the appliance.
 - g. Appliances **shall** be removed from vault when no longer required.
 - h. All appliances **shall** have an operational control valve at the supply tank.

5.7.5 Fire Equipment

1. Each crew **shall** be equipped with approved and maintained fire extinguishers. **Refer to the authority having jurisdiction for requirements.**
2. Fire extinguishers shall be readily available, and workers trained on its use.

5.7.6 Exposed Live Front High Voltage Switchboards

1. Approved procedures **shall** be followed.
2. Sufficient illumination **shall** be provided to both front and back of switchboard.

3. The space in rear of switchboards **shall** be clear and free of foreign equipment or supplies.

5.7.7 Cables on Reels

1. Only competent workers **shall** handle large reels of cables.
2. Suitable-type reel jacks or reel stands **shall** be used for support when cable is being placed on or removed from the reel.

5.7.8 Handling Conduit

1. Gloves appropriate to the material being handled **shall** be worn.
2. When handling fiber duct, workers **shall** wear gloves, wear protection on their arms, wear eye protection, and have protective lotion applied to their face and neck when cutting.

5.7.9 Opening Utility Access Covers

Utility access holes differ in design, and some may require more preparation to ensure you have the correct tools. Some tips for safely opening a utility access hole cover are:

1. Loosen the cover by striking it with a sledgehammer or mallet.
2. Clean the lid from any debris and/or ice by using water or a blower.
3. Stand opposite the keyhole to leverage the hook and safely pry open the lid.
4. Lift with your legs while using the hook as a lever to pop open the covering. Use your legs to push down and pry up the lid to lift the utility access hole cover.
5. Ensure that your hands and feet are away from the opening.

6. Insert a block between the lid and the rim and pull the lid toward yourself and away from the opening. Prop the lid on the block so that it is easier to replace later.
7. Hydraulic mechanical equipment is available that removes utility access hole covers.

Occasionally, a utility access hole cover will be more difficult than usual to open or require being open for an extended period. Working around these open utility access holes will require strict communication and safety measures. The below lists a few potential dangers to be aware of:

1. Breaking the lid – sometimes the cover can get stuck in its ring, and removal measures with a sledgehammer can cause it to break.
2. Using your hands for removal – No matter the circumstances, contractors should never use their hands when removing utility access hole lids.
3. Trip or Fall Hazards – Once the cover has been removed, place a safety barrier around the open utility access hole and the lids to avoid trips and falls.

5.8 GROUND DISTURBANCE EXCAVATION AND TRENCHING

Excavation: a hole left in the ground as the result of removing material.

Trench: an excavation in which the depth exceeds the width.

5.8.1 Soil Types

The type of soil determines the strength and stability of trench walls. Identifying soil types requires a competent person. Even hard soil may contain faults in seams or layers that make it unstable when excavated. Other soil types that are common are: soft, sandy, loose, or filled.

The foreperson, supervisor and workers **must** be knowledgeable about soil types found on a project and plan protection according to regulations set out by the authority having jurisdiction.

5.8.2 Trenching and Excavating

1. **Prior to any ground disturbance, location of underground services and other structures MUST BE VERIFIED before work commences. Prior to bringing any mobile/ heavy equipment on site a communication protocol must be established between operators and workers.**
2. If the potential exists to strike a utility during the locate process, workers must hand dig or hydro-excavate to properly locate / expose the utility.
3. If trench / excavation depth is over 1.2 meters (4') in depth, sloping or shoring is required.
4. Always slope or shore vertical walls as per

- soil type as indicated by the authority having jurisdiction.
5. Trenches / excavations, depending on depth and soil type, shall be assessed / approved / inspected prior to entry, as required by the authority having jurisdiction. Several factors shall be considered including moisture, vibration, surcharge, and previous excavation.
 6. Shoring cages/trench boxes **must** be engineered. Trained workers shall install shoring equipment or support materials using regulated materials.
 7. Keep spoil piles and equipment back from the edge of a trench to prevent wall collapse. For distances and/or weights, refer to the authority having jurisdiction.
 8. The trench/excavation must have adequate entrance and exit points every eight meters (25'). Use Ladders for safe access & egress extended 3' above ground and secured.
 9. Proper housekeeping around trenches **must** be maintained to prevent trip / fall hazards.
 10. A system may be required to prevent workers from falling into a trench/excavation, refer to the authority having jurisdiction.
 11. Ensure water is pumped out of the trench as water flow and granules can undermine the trench walls.
 12. Trenches / excavations may be subjected to atmospheric hazards due to equipment, processes, or seepage, refer to the authority having jurisdiction.
 13. Work **shall not** be performed in a trench/ excavation unless another worker is

working above ground in close proximity for emergency response purposes. Some Regions do not permit working alone in a trench/excavation, refer to authority having jurisdiction.

5.8.3 Entering Trenches and Excavations

1. Where personnel are required to enter a trench or excavation deeper than 1.2 M or 4 feet, the excavation must be sloped on a one-to-one basis or engineered approved trench box be provided.
2. ***No worker shall ever enter or work in a trench alone/without supervision.***
3. *Consult with the authority having jurisdiction for shoring and retaining wall requirements.*

5.8.4 Barriers

1. Hazardous areas **shall** be cordoned-off with barriers or danger tape.
2. A 1.1M (4') barrier **shall** be erected where a worker may fall more than 2.4 m (8') into an unsloped excavation.
3. Barriers may only be removed for work to proceed with permission of the supervisor. They **shall** be replaced immediately after work is completed.

5.9 LIFTING AND HANDLING LOADS

5.9.1 Ergonomics/Lifting/Carrying

Most ergonomic incidents are due to improper lifting/carrying methods, as well as trying to lift more than an acceptable weight for one worker.

All manual lifting **shall be planned**, and safe-lifting practices followed:

1. Workers **shall** know their physical limitations and the approximate weight of materials they are trying to lift.
2. Obtain assistance in lifting heavy objects whenever that task may be more than can be safely handled.
 - a. 50+ lbs may be considered “heavy” under ideal ergonomic conditions (neutral posture, close to the body, infrequent lift, good grip).
 - b. Even 20–30 lbs may be considered “heavy” when:
 - c. lifted repeatedly,
 - d. lifted above shoulder height, below knee height, or far from the body, or
 - e. performed in awkward postures or restricted spaces.
3. Bulky, unstable, awkward, or difficult-to-grip items may be considered “heavy” even when actual weight is low, due to balance and handling risks. Before any manual lifting is done, the use of power equipment or mechanical lifting devices such as dollies, trucks or similar devices should be considered and employed where practical.

4. Bulky loads should be carried in such a way as to permit an unobstructed view ahead.
5. Ensure a good grip before lifting.
6. Lift gradually; lift slowly, smoothly and without jerking.
7. The back should be kept close to vertical or straight, and the lifting done with the leg muscles, which are stronger.
8. Avoid bending. Do not place objects on the floor if they **must** be picked up again later.
9. Avoid twisting. Turn your feet, not your hips or shoulders. Leave enough room to shift your feet so as not to twist.
10. Do not be tempted at the last moment to swing the load onto the deck or shelf by bending or twisting your back.
11. Avoid reaching out. Handle heavy objects close to the body. Avoid a long reach out to pick up an object.
12. Pipes, conduits, reinforcing rods and other conductive materials should not be carried on the shoulders near exposed live electrical equipment or conductors.
13. When two or more persons carry a heavy object that is to be lowered or dropped, there **shall** be a prearranged signal for releasing the load.
14. When two or more persons are carrying an object, each worker, if possible, should face the direction in which the object is being carried and maintain continuous communication.
15. Keep in good physical shape. Get proper exercise, maintain a good diet, and make sure you are well rested.

5.10 POWERED MOBILE EQUIPMENT

5.10.1 Working Near Heavy Equipment

1. Be aware of all heavy equipment operating on site.
2. A spotter is required when:
 - a. The operator cannot see full range of movement due to obstructions or blind spots.
 - b. Working near overhead powerlines or other overhead hazards.
 - c. When backing up heavy equipment with an obstructed view to the rear.
 - d. When visibility is poor or the work site is congested.
 - e. When the operator is attempting to maneuver in tight spaces and/or narrow paths.
3. Spotters shall:
 - a. Wear high-visibility clothing
 - b. Avoid walking into the path of the vehicle, moving equipment or swinging load.
 - c. Avoid walking directly behind heavy equipment while spotting.
 - d. Not use phone, headphones, or other items that can distract while spotting.
 - e. Ensure constant visual contact with the driver while the equipment/vehicle is in motion.
 - f. Be trained in blind-spot awareness.
4. Back-up alarms or alternative (horn) should be used to alert of reversing all mobile equipment.

5. Whenever possible, plan the layout of the project, or tasks to allow for drive-through operations that will limit the need for vehicles to backup.
6. Always keep eye contact with the operator and reduce foot traffic in areas where mobile equipment is to be working.
7. Establish designated travel areas, ideally with barricades or other means to set apart from work locations.
8. Know the visual restrictions and blind spots of various types of equipment.
9. Learn the patterns and habits of operators and specific machines.
10. Always wear high visibility apparel.
11. Operators and ground workers should discuss and agree upon hand signals prior to carrying out the work.
12. Always stay clear of swing zones, blind spots, and pinch areas.
13. Whenever possible, mark pinch points on equipment and/or tools with conspicuous signage or colour markings so that it is visible from all sides.
14. Stay outside equipment swing radius unless directed by operator.
15. Never walk under raised buckets/attachments or between equipment and fixed objects.
16. Establish exclusion zones around equipment using cones/barriers.
17. Confirm utility locates before digging; identify overhead hazards.
18. Adjust work for poor visibility or weather (fog, snow, dusk).
19. Use standardized hand signals or radios.
20. Hand-dig/vacuum excavate within tolerance zones.

21. Use a spotter when working near utilities.
22. Stop work if an unknown utility is found.
23. suspend operations during high winds or lightning.
24. Control dust and prevent fluid leaks from entering waterways.

5.10.2 Operators

1. Perform and record a pre use/trip inspection.
2. Ensure workers are clear of the equipment before operating it and signal when backing up.
3. Keep bucket/attachment low when traveling.
4. Never bypass or disable safety locks, alarms, or interlocks.
5. Travel at a safe speed or speed posted on site.
6. Use a signal person when views are obstructed.
7. Always face ladder/step access and maintain three-point contact when accessing or exiting the equipment.
8. Operators **shall** be trained on the specific make and model and follow manufacturer's manual.
9. Power down or lockout remotes when not in use.
10. Whenever possible, stickers should be added to remotes to communicate requirement to power down or lock out remotes when not in use.
11. Operators must be trained on the specific make and model being used.
12. Follow the manufacturer's operating manual and rated lifting capacities.

13. Keep bucket/attachment low when traveling.
14. Always wear a seatbelt.
15. Sound horn before movement.
16. Keep tracks/wheels perpendicular to slopes where possible.
17. Maintain safe distance from trench edges and unstable ground.
18. Lower attachments to the ground and remove key when equipment is unattended.
19. Complete documented **daily pre-operational inspection**.
20. Verify attachments are properly locked; perform **curl test** after change-out.
21. Only lift if manufacturer permits.
22. Use approved lifting points and proper rigging.
23. Do not lift personnel or use buckets as work platforms.
24. Follow manufacturer procedures for connecting/locking attachments.
25. Never bypass locking pins.

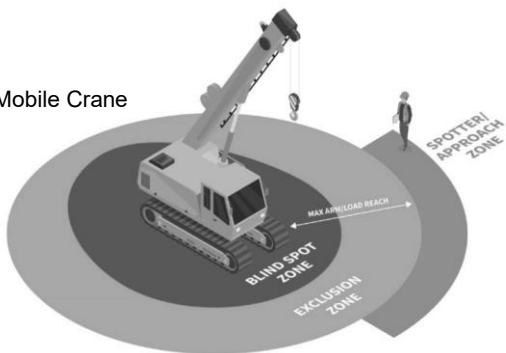
5.10.3 Driver Blind Spots

1. Stay out of blind spots, swing zones, pinches, and bites.
2. Know the capabilities of different machines. (i.e., Swing Radius)
3. Keep eye contact between operator and signaller.
4. Yield right of way.
5. Stop machinery and escort pedestrians through worksite.
6. Do not take 'shortcuts' across areas where mobile equipment is working.

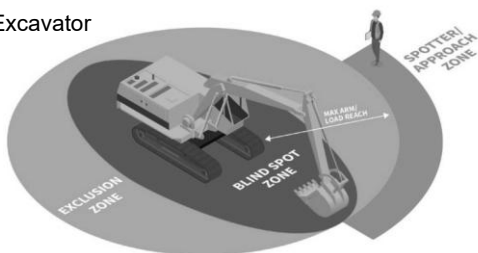
7. Use equipment cameras, mirrors, or proximity alarms if available.
8. Operators must stop work immediately if a pedestrian enters the danger zone.

DRIVER BLIND SPOTS

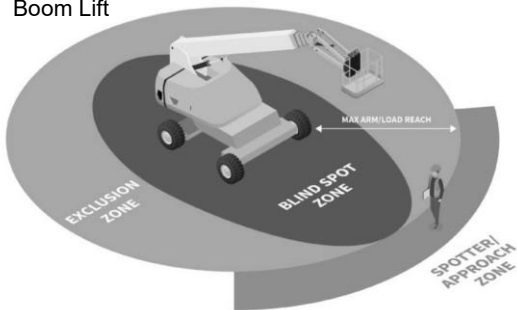
Mobile Crane



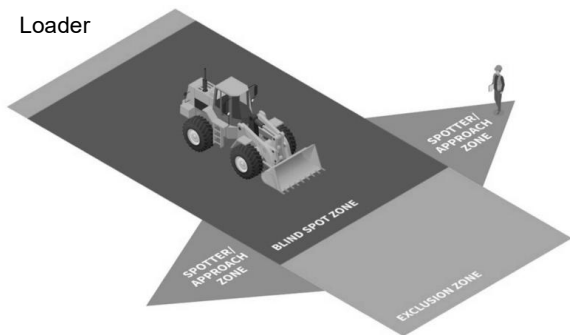
Excavator



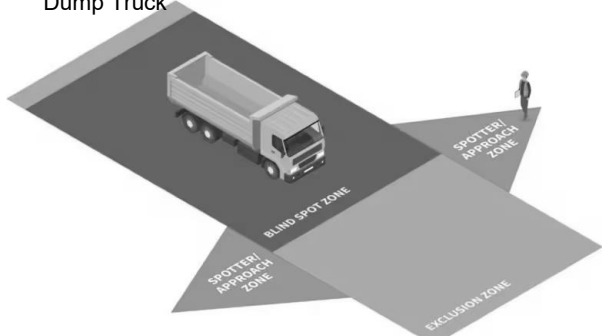
Boom Lift



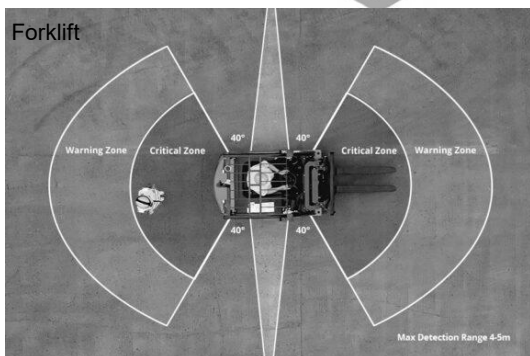
Loader



Dump Truck



Forklift



5.10.4 Forklifts / Lift Trucks

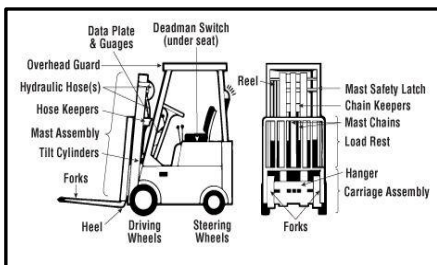
1. Operators **must** be trained on the class of forklift they are required to operate.
2. A pre-operation inspection **must** be completed by the operator prior to use of the forklift for each shift.
3. Operators **must** yield to pedestrians for right-of-way.
4. Workers **shall** not modify equipment, unless using approved attachments by the manufacturer and reflected on the forklift nameplate.
5. No person, thing or object **shall** be used to add counterweight to the forklift and workers **shall not** ride on the equipment.
6. Operators **must** always wear their seatbelts while operating the forklift.
7. Maintenance **must** be completed by a competent worker using the appropriate PPE.
8. Batteries **must** be charged in a well-ventilated area away from sources of ignition.
9. Operators **must** park forklifts in designated locations, away from entrances, with the forks on the ground and parking brake engaged.
10. When travelling with the forklift, operators **shall** keep forks 4-6" above the ground.
11. Only use the forklift as it was intended, paying attention to load capacities and safety and operation rules.
12. Operators **shall** make turns slowly.
13. Operators **shall** report defects

immediately to their supervisor.

14. When picking up a load, position the load according to the recommended load centre. The load limit of the forklift decreases as the load centre is raised. Keep loads close to the front wheels to keep forklift stable. Adjust the fork as wide as possible to fit the load and to provide a more even distribution of weight. Space the fork evenly from the centre to balance the load.
The mast shall be tilted back just enough to stabilize the load. Uneven or piece loads shall be secured.
15. Only a man lift attachment, certified for lifting humans, with guardrails can be used to lift a worker using the forks.
16. When operating a loaded forklift on a ramp, the operator **shall** drive in reverse going down a ramp and drive forward going up the ramp. Do not turn on the ramp.
17. When operating an unloaded forklift on a ramp, the operator **shall** drive forward going down a ramp, and drive in reverse when going up the ramp. Do not turn on the ramp.
18. Operators **shall** adhere to the combined center of gravity of the machine load, using the load center and lifting capacities indicated on the nameplate to determine if a load can be safely lifted and not exceed the capacities.
19. Forks **shall** never be raised at eye level.

Operators shall lift loads slowly and carefully only after the forklift is in position to place or pick up a load.

20. No suspended loads shall be left unattended at any time.
21. Propane-powered forklifts must have the propane cylinder valve closed when parked or not in use (end of shift/day).
22. Operators **shall** use wheel chocks when parked and during maintenance operation.
23. Personnel entering a lift basket must be trained in the selection, use and care of Fall Protection



5.11 POWER TOOLS AND EQUIPMENT

Power tools and equipment are driven by battery, gasoline, electricity, compressed air (pneumatic), hydraulic pressure and explosive powder.

1. Where necessary, workers using powered tools & equipment shall be trained in the safe use, operation, and maintenance of their powered tools & equipment.
2. During the maintenance and/or replacement of parts/bits, disconnecting the power and/or removal of the battery is required for all power tools and equipment.
3. Whenever possible, mark pinch points on tools and equipment with conspicuous signage and/or colour markings so that it is visible from all sides.
4. Prior to starting work tasks, workers and forepersons shall confirm they have the required tools to safely complete their tasks.
5. Where auxiliary (secondary) handles are provided, 2 handed control of tools **must** be implemented.
6. When working on loose materials, the material must be secured using a bench vice or tripod pipe chain. Do not operate a power tool while holding material in other hand or using body to support material.
7. For battery-operated tools, workers must remove the battery pack before changing blades, bits, accessories or performing any maintenance, just as they would disconnect the power source on corded

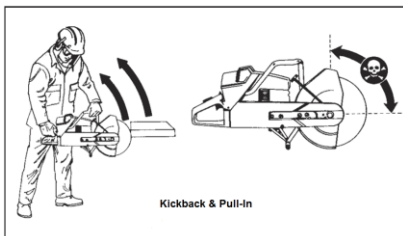
tools.

5.11.1 Saws

1. All saws are to be used, maintained, and repaired as per the manufacturers' instructions.
2. Loose clothing must not be used near any operating saw.
3. All guarding must be left on saw and not be tampered with.
 - a. If guarding is defective, the saw must be tagged and removed from use.

5.11.2 Quick Cut Saws

1. Only competent workers can operate Quick Cut saws.
2. Use caution when preparing the oil / gasoline mixture and when fuelling the saw.
3. No smoking or ignition sources **shall** be allowed in the area where fuel is mixed, or tanks are filled.
4. Fill in well-ventilated areas.
5. Spilled fuel **must** be wiped up or cleaned up with absorbent.
6. Check for leaks.
7. Use proper PPE such as hard hat, gloves, safety glasses, full face shield, and depending on what is being cut, a respirator.
8. Use the proper grip and stance.
9. Make sure the area is clear.



Note: Kickback can happen extremely fast and with tremendous power. If the segment of the disk or blade shown above contacts the work, the disk or blade starts to climb out of the cut and can throw the saw up and back toward the operator with great force.

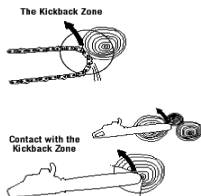
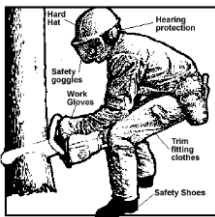
5.11.3 Chop Saws

1. Material to be cut should be positioned 90⁰ (ninety degrees) to the blade.
2. Do not rush the cut.
3. Start the saw so that the blade is spinning before cutting into the material.
4. Let blade stop before removing material.
5. Use proper PPE such as hard hat, gloves, safety glasses, full face shield, and depending on materials being cut, a respirator.

5.11.4 Chain Saws

1. Only workers who are competent with the use of a chain saw will be permitted to use it.
2. The proper personal protective equipment **shall** be worn, safety glasses and face shield, hearing protection (earmuffs), gloves (leather, anti-vibration), leg protection (chaps with nylon pads, close woven fabric)

- and head and foot.
3. Fuelling of the saw **shall** be done in a well-ventilated area only when the saw is off.
 4. An approved safety container **shall** be used to contain the fuel used along with a proper spout or funnel for pouring.
 5. Smoking is prohibited while tank is being filled.
 6. Saws **shall** be firmly held when being started and should not be started until in the immediate work area.
 7. Start the saw so that the chain is spinning before cutting into the material.
 8. Persons not involved with the use of the saw **shall** remain at least 1.8 M (6') from the operator except when working aloft from an aerial device.
 9. The correct methods of starting, holding, carrying or storage and use of the saw as directed by the manufacturer **shall** be used.
 10. Ensure that the chain brake is functioning properly and adequately stops the chain.
 11. The chain **shall** be sharp, have the correct tension, and be adequately lubricated.
 12. When carrying / transporting a chain saw, the bar guard **shall** be in place, the chain bar **shall** be toward the back and the motor **shall** be shut off.
 13. The chain saw **shall not** be used for cutting above shoulder height.



Note: The most common and most violent kickback occurs when contact is made, either accidentally or intentionally, in this “kickback zone.” In some cases, the blade tip may move upward and back toward the operator who could suffer a serious or fatal injury.

5.11.5 Handheld Power Circular Saw

The following are the minimum accepted practices to be used with this saw:

1. Approved safety equipment including safety glasses, or a face shield **shall** be worn.
2. Where harmful vapours or dusts are created, approved respiratory protection **shall** be used.
3. The proper sharp blade designed for the work to be done **shall** be selected and used.
4. The power supply **shall** be disconnected before making any adjustments to the saw or changing the blade.
5. Before the saw is set down, the operator **shall** ensure that the retracting guard has fully returned to its down position.
6. Both hands **shall** be used to hold the saw while ripping.
7. Maintenance **shall** be done according to the manufacturers’ specifications.

8. Ensure all cords are clear of the cutting area before starting to cut.
9. Before cutting, check the stock for foreign objects or any other obstruction that could cause the saw to “kick back.”
10. When ripping, the operator **shall** ensure that the stock is held securely in place. Use a wedge to keep the stock from closing and causing the saw to bind.

5.11.6 Band Saws

1. Only competent workers to operate machinery.
2. Review the manufacturer’s instructions prior to use.
3. Conduct a pre-use inspection.
4. Check blade condition, ensure the blade is sharp, undamaged, and properly installed.
5. Choose a blade suitable for the material you’re cutting.
6. Ensure the material is clamped or supported properly.
7. Remove any tripping hazards and ensure adequate lighting.
8. The operator and those within the immediate vicinity of work shall wear safety glasses or a face shield and hearing protection.
9. Use saw blades that are sharp, properly set, and suitable for the job.
10. Keep hands away from the line of the cut.
11. Use a push-stick to remove cut pieces between the fence and the saw blade, or when hands are too close to the blade.
12. Ensure adequate lighting around workspace.

13. Do not use excessive force when pushing the wood past the blade.
14. Do not leave the saw running unattended.

5.11.7 Drills

1. Review the manufacturer's instructions prior to use.
2. Conduct a pre-use inspection on the drill, bits attachments and accessories (if applicable) to ensure they are in good, working condition.
3. When using magnetic drills (mag drills) ensure that the thickness of the material is at least 3/8" thick, free of debris, and clean from coatings for proper adhesion.
4. Select the bit or attachment suitable for the size of the drill and the work to be performed.
5. Use the auxiliary (second) handle.
6. The operator and those in the immediate vicinity of work **shall** wear safety glasses or a face shield and hearing protection.
7. The operator **shall** ensure that the bit or attachment appropriately selected and is secured.
8. Do not use excessive force to drill into hard material.
9. Check that the bit runs 'true' and does not wobble. Excess vibration must be addressed immediately.
10. Do not adjust the tool when it is plugged in. Unplug and/or isolate from power sources when adjusting (i.e. changing drill bit)
11. Secure the material to be drilled.
12. Do not reach under or around material

- being drilled.
13. Do not use high speed drill bits without cooling or lubrication.
 14. When conducting invasive drilling, identify any potential hidden hazards behind the area to be drilled.
 15. Keep cords clear of the cutting area during use.
 16. Slow the rate of feed just before breaking through surface.
 17. Drill a smaller pilot hole before drilling larger.

5.11.8 Core Drilling

1. Prior to drilling, all precautions **must** be taken to ensure that there are no hazards that can be contacted by the drill blade while operating (e.g., Utility lines).
2. Only workers who are competent with the use of a coring drill will be permitted to use it.
3. Pre-use inspection of the drill and the components is required.
4. The installation and operation of the drill **shall** be conducted as per the manufacturers' instruction.
5. Cords and hoses shall be organized and placed in a way to avoid tripping and/or entanglement.
6. The proper personal protective equipment **shall** be worn; eye protection, face/respiratory protection, hearing protection, hand protection, foot protection, and head protection.
7. Do not wear loose fitting clothing or jewellery around an operating drill. Keep

- long hair tied back and keep hands and clothing away from moving parts.
8. Ensure that the area is properly secured, and that people and items are kept away from potential falling cores using signs, barriers, and a spotter, as necessary.
 9. Feed tap pressured water into the hole to bring up slurry and cool down the drill bit. Ensure water is kept away from electrical components of the drill.
 10. Do not drill inverted holes using an electrical drill unless equipment is designed with specific water collection ring.
 11. Where it is not practicable to use water suppression, alternatives shall be considered to control dust output such as a vacuum bag ventilation system.
 12. Work **shall not** be conducted above shoulder height. If work is above shoulder height, the use of appropriate scaffold is required.

5.11.9 Guards on Machinery and Equipment

1. Machines or equipment having exposed moving parts **shall** be equipped with guards which prevent contact with moving parts or prevent access to the danger zone during operation.
2. Guards **shall** be in place and maintained so that they are capable of effectively performing the functions for which they are intended.

5.11.10 Hydraulic Jacks

1. Calculate weight of lift and use proper size jack.
2. Always use cribbing or blocking for sustained hold.
3. Position jacks on firm foundations.
4. Keep cylinder in full contact with load. Do not lift off centre.
5. Always follow manufacturers' operating instructions.

5.11.11 Explosive and Actuated Fastening Tools

The manufacturers of these devices provide detailed instructions regarding their use and maintenance. These instructions, along with the legislation specifically set out for their use, shall be closely adhered to at all times.

The following general recommendations apply to all explosive and powder actuated tools:

1. Only competent operators are to use this type of tool. Black & McDonald will validate that the user possesses training issued by the manufacturer, authorized dealer / distributor, or other competent source.
2. The tool **shall** be approved for use by the authority having jurisdiction.
3. The tool **shall** be loaded just prior to use with the correct load for the job anticipated. Tools should never be loaded and left to sit or be moved to an alternate work site after being loaded.
4. The tool should never be pointed at anyone, whether loaded or unloaded. Hands should be always kept clear of the muzzle end.
5. Explosive / powder actuated tools **shall** always be stored in their proper lockable boxes.
6. Explosive / powder actuated tools **shall**

- never be used in an explosive atmosphere.
7. When used, the tool **shall** be held firmly and at 90° angles to the surface being driven into.
 8. Unload the tool after the use prior to transport or storage
 9. The operator **shall** wear eye protection. Where there is a danger of sprawling, full-face protection **shall** be worn. Hearing protection **shall** also be worn.
 10. To prevent free-flying fasteners, ensure that the material being driven into will not allow the fasteners to completely pass through it (i.e., glass block, hollow tile, etc.).
 11. Manufacturers' recommendations should be consulted and followed whenever there is a doubt about the material being driven into, maintenance procedures or load strength to be used.
 12. Always be aware of the other workers. Where a hazard to other workers is created by this operation, signs and barricades identifying the hazard area are mandatory.

5.11.12 Impact Drivers

1. Choose the correct bit for the task and tool being used.
2. Understand the speed required to safely complete the task. The more torque required; the less speed needed. You can slow the speed by lightening the pressure on the trigger, or some tools are equipped with a speed selection option.
3. Always use eye protection when operating an impact driver
4. Ensure to not overtighten screws or nuts – this could cause damage to the property or cause the tool to kick back at you.
5. Keep fingers away from the chuck when using the impact driver.

6. Unplug the tool when not in use.

5.11.13 Inspections

1. Review the manufacturer's instructions before establishing an ongoing preventative maintenance schedule.
2. Workers operating powered tools and equipment shall inspect tools & equipment before each use

5.12 HOT WORK

5.12.1 Tiger Torches

1. Tiger torches shall be used only for preheating of piping etc., prior to welding.
2. When a torch is used, an adequate fire extinguisher shall be present.
3. Torches **shall not** be used for heating of work areas or thawing of lines and equipment, etc.
4. Ensure that the propane bottles are properly shut off when torch is not in use.
5. Fuel lines **shall** have regulators.
6. Propane bottles shall be secured in an upright position.

5.12.2 Bench Grinders

1. All bench grinders **shall** be used as per manufacturers' instruction.
2. Check the tool rest for the correct distance from the abrasive wheel, maximum 1/8" or 3mm.
3. Replace the grindstone when adjustment of the rest cannot provide 1/8" or 3mm clearance.
4. If the wheel has been abused and ground to an angle or grooved, reface the wheel with the appropriate surfacing tool.
5. Cracked or defective abrasive wheels **shall** be removed from service immediately.
6. Always protect your eyes with goggles and a face shield when grinding as well as hearing & hand protection.
7. Each time a grinding wheel is mounted, the maximum approved speed stamped on the wheel blade **shall** be checked against the shaft rotation speed of the

machine to ensure the safe peripheral speed is not exceeded. A grinding wheel **shall not** be operated at peripheral speed exceeding the manufacturer's recommendation.

8. Grinding tools **shall not** be used without the safety guards, protective flanges, and tool rests installed and maintained in proper adjustment (See #1).
9. 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.
10. Bench grinders are designed for peripheral grinding. Do not grind on the side of the wheel.
11. **Do not** stand directly in front of a grinding wheel when it is first started.
12. **Do not** wear loose clothing while operating.

5.12.3 Portable Grinders

Abrasive wheels can cause severe injury. Proper storage, use of wheels, and maintenance of wheels **must** be observed.

1. Familiarize yourself with the grinder operation before commencing work.
2. Ensure proper guards are in place and that safety glasses, face shields, gloves, safety boots and hearing protection are worn when using portable grinders.
3. Unplug or remove battery from grinder before changing wheels.
4. Never exceed the maximum wheel speed (every wheel is marked). Check the speed marked on the wheel in revolutions per minute (rpm). Compare it to the speed on the grinder.

5. When mounting the wheels, check them for cracks and defects, ensure that the mounting flanges are clean, and the mounting blotters are used. Do not over tighten the mounting nut.
6. Always match the wheel to the job. I.e., Use grinding disc for grinding, zip-cut disc for cutting, flapper disc for buffing.
7. Side handles on grinders **must** be used.
8. Before grinding, run newly mounted wheels at operating speed to check for vibrations.
9. Do not use grinders near flammable materials.
10. Never use the grinder for jobs for which it is not designed, such as cutting and re-rubbing.
11. Never wear loose clothing while operating a grinding tool.

5.12.4 Welding/Cutting/Burning

1. Before starting any work ensure Hot Work or Fire Watch permit are in place as required.
2. Ensure that all permits have been obtained prior to welding or cutting of drums, tanks, and lines.
3. A welder **shall** never work alone. A competent person **shall** maintain a fire or spark watch. Refer to the jurisdiction having authority.
4. Always ensure that adequate ventilation is supplied since hazardous fumes can be created during welding, cutting, or burning.
5. All cylinders, regulators, gauges, hoses, and fittings **shall** be tested for leaks using an approved testing substance prior to using the equipment.

6. Where other workers may also be exposed to the hazards created by welding, cutting, and burning, they **shall** be alerted to these hazards and protected from them by using protective screens.
7. A worker **shall not** begin welding / cutting / burning work without a Hot Work permit.
(As required).
8. Appropriate firefighting and prevention equipment **shall** be provided and within easy access to the welding / cutting / burning work area.
9. The work area **shall** be inspected for combustible, flammable or explosive material or vapours prior to commencing welding / cutting / burning work.
10. Cables and hoses **shall** be inspected for cracks, cuts, or burns prior to use. Cables and hoses **shall** be monitored and protected from slag and sparks during use.
11. Never enter, weld, or cut in a confined space without proper gas tests and a required safety tagline partner. The worker **shall** refer to or create a procedure for confined space entry prior to commencing any hot or cold work in a confined space.
12. When working overhead, fire resistant materials (blankets, tarps) to control or contain slag and sparks **shall** be used.
13. Cutting and welding **shall not** be performed where sparks and cutting slag will fall on cylinders (move all cylinders away to one side).
14. Open all cylinder valves slowly. The wrench used for opening the cylinder

- valves **shall** always be kept on the valve spindle when the cylinder is in use.
15. Never leave the valve wrench on the cylinder when it is not in use.
 16. All lines, drums, and tanks **shall** be properly flushed and cleaned of flammable products prior to welding.
 17. Welding, cutting, and burning **shall** be performed only by persons experienced and trained.
 18. Those performing welding, cutting, and burning operations, including helpers and attendants, **shall** wear suitable PPE including long sleeves (or arm protection) and pants.
 19. A torch **shall not** be lit with matches or from hot work. Use proper igniters.
 20. Check valves **shall** be used on all oxyacetylene regulators and torches to prevent flashback in the hose and / or regulators.
 21. Never attempt to stop the flow of any compressed gas by placing any body part against the gas flow. This could result in a bubble of the gas entering the blood stream at the point of contact. Gas bubbles in the blood stream can be fatal.
 22. Electric welding machines **shall** be properly grounded prior to use.
 23. Rules and instructions supplied by the manufacturer of cutting or welding equipment **shall** be followed.
 24. When electrode holders are to be left unattended, the electrode **shall** be removed and the holder placed or protected to prevent electrical contact

- with workers, the public or, conducting objects.
25. When a welder stops work for any length of time, or when the welding machine **must** be moved, the power switch **must** be opened.
 26. New or used electrodes **shall not** be left lying on floors or walkways causing a potential tripping or slipping hazard. Deposit used electrodes in the designated metal bucket.
 27. Required use of a full-face shield with safety glasses or goggles/spoggles.

5.12.5 Portable Arc Welders

Gas and diesel portable arc welders are pieces of equipment that must be treated like a vehicle. Do not operate them indoors.

1. Be sure the machine is attached to the transporting unit.
2. Check all fluid levels, water, oil, and gas to be sure they are at acceptable levels for operation.
3. When fuelling, **do not** fill the tank completely. Fuel expands as the outside temperature rises. This may result in seepage along with an increased risk of fire. Use a spill tray or catch container if available.
4. **Do not** fuel the machine while it is running.
5. Be sure the radiator and gas caps are in proper working order and securely attached.
6. Do a “walk around” to check for damage and leaks.
7. Competent workers **shall** do the repairs and standard maintenance.
8. Make sure all cables are secured when transporting.
9. Ensure the side covers are kept closed to

protect the machine from any damage from external objects and outside weather, as well as to protect the operator and others from the moving parts of the machine.

5.12.6 Soldering

1. Whenever possible, use lead free soldering.
2. Conduct work in a well-ventilated area.
3. Never touch the element, or tip, of the soldering iron.
4. Conduct work on a non-flammable surface and ensure that flammable or combustible materials are stored away from the work.
5. FR clothing that covers the arms and legs **must** be worn.
6. Appropriate hand protection **must** be worn to prevent burns.

5.13 PRESSURE TESTING

Specific pressure testing procedures are required when workers are exposed to any of the following hazards (including but not limited to):

- Applying stored energy to an assembly of parts, in order to verify its strength, integrity and/or its functionality.
- Working in the vicinity of, or in identified areas where pressure testing operations may result in fragments or assembly components being ejected from the system that is being tested.
- Working with stored energy which may cause injury or property damage as a result of failure of assembly components causing leakage of testing medium.

5.13.1 Pressurized Systems

- Depressurize lines to reduce stress loads on system and use blocking systems or release valves as applicable.
- Lock out and tag out the system.
- Test to verify.
- Stay out of the line of fire.

5.13.2 Compressed Air

Air-powered tools in construction range from stapling guns to jack hammers. These tools can be dangerous if not used as outlined by manufacturers' specifications.

1. Never use compressed air to blow debris or to clear dirt from person clothing or work surfaces as this could result in injury to the person or toxic dusts being blown into the air.
2. Ensure that the air pressure has been turned off and the line pressure relieved before disconnecting the hose or changing tools.
3. Any hose that may whip when disconnected **shall** be attached to a rope or chain to prevent whipping.
4. Wear PPE including eye protection and face shields and ensure other workers in the area are made aware of or have restricted access to the hazard area.
5. Hoses **shall** be checked on a regular basis for cuts, bulges, or other damage. Ensure that defective hoses are repaired or replaced, and all inspections are documented.
6. A proper pressure regulator and relief device **shall** be in the system to ensure that correct pressures can be maintained.
7. The correct air supply hoses **shall** be used for the tool / equipment being used.
8. The equipment **shall** be properly maintained according to the manufacturers' requirements, and maintenance **shall** be documented.
9. Follow the manufacturers' general instructions for use and maintenance and comply with safety requirements of the authority having jurisdiction.

5.14 PREVENTATIVE MAINTENANCE

5.14.1 Pre-use Inspections

All vehicles, equipment and PPE should be thoroughly inspected daily by their operators to monitor wear and tear. If more than one person is responsible for the equipment or vehicle, responsibility for inspections should be assigned.

What to check?

Confirm presence and working condition of appropriate safety equipment. Fluid levels, belts, hoses, and electrical connections should be checked. This **shall** be done in conjunction with the PJHA.

1. These inspections assist employees in identifying wear and tear of equipment due to daily usage: *This list is not all-inclusive.*

Mobile equipment such as:

- Forklifts
- Cranes
- Elevated work platforms
- Motor vehicles
- Grounds keeping equipment.
- Ride-on equipment
- Drilling rigs
- Bucket trucks
- Electric pallet jacks
- Backhoe, excavator, etc.

Production equipment such as:

- Lathes
- Mills
- Table saws
- Punch presses
- Conveyor systems
- Floor stand mixers
- Jacketed / Tilt Steam kettles
- Life safety equipment

- Fall protection equipment.
- Equipment with emergency stops
- Ladder
- Multimeters/High Voltage Equipment

Personal Protective Equipment such as:

- Harnesses/Lanyards/Anchors
- Face shields
- Safety Boots
- Gloves
- Head protection
- Eye protection
- Respiratory Equipment
- Arc Rated Clothing, Hot Gloves etc.

Hoisting and Rigging Equipment such as:

- Wire rope slings
- Synthetic web slings
- Steel chain slings
- Rigging hardware: hooks, shackles, turnbuckles, come-a-longs, etc.

For further assistance in identifying equipment or processes that should have pre use inspections, contact your regional safety department, or refer to the manufacturer's instructions of the equipment being used.

2. Pre-Use Inspections **shall** be conducted prior to use for the first time that day, the employee using the equipment must check the inspection log and determine if it has been inspected.
3. The employee conducting the pre-use inspection completes the inspection and then dates and signs the checklist/form (where available) and returns it to the appropriate location.

4. If the employee determines that there is a deficiency this must be documented/corrected before use and reported to the Supervisor
5. Minor issue(s) that the employee is qualified to correct (oil top up, low fuel, dead battery etc.) **shall** be resolved so the equipment can be used.
6. Major issue(s) that the employee cannot correct (cracked/broken hoses or belts, no safety devices etc.) to make it safe to use then the equipment **shall** be taken out of service and the supervisor must be contacted immediately.

5.14.2 Annual Inspections

1. Annual inspections of equipment or materials (i.e. fall protection equipment, hoisting and lifting, ladders, fire extinguisher, etc.) shall be conducted in accordance with the manufacturer's recommendations and/or local legislation.
2. Records and logs of the annual inspections are required to be kept and maintained in accordance with B&M document control.
3. Annual inspections are required to be conducted by a competent person. Oftentimes, these competent people are external resources such as engineers.
4. Any damaged or defective equipment must be tagged and removed from service.
5. The tags will be coloured to match the chart below:

January – December 2026	Yellow
January – December 2027	Purple
January – December 20258	Blue
January – December 2029	Orange
*Pattern repeats	

5.15 INDUSTRIAL HYGIENE

Considerations for conducting hygiene testing may occur under the following circumstances:

1. When incident reports, including reporting of unusual symptoms at work, workplace inspections, or incident investigations have been unable to identify the source of the hazard or the appropriate corrective action.
2. Where the designated person(s) conducting a Job Hazard Analysis does not have the skills, knowledge, and equipment to accurately assess the hazards.
3. When unable to determine the extent of the worker exposure to the hazard.
4. If an order from the health and safety regulatory body requires it (unless management has obtained a suspension of the order from the appropriate regulator pending an appeal of such order).
5. When required by applicable health and safety legislation.

Qualitative assessments will be documented and maintained with the JHA.

5.16 OCCUPATIONAL HEALTH

1. The use of PPE must be considered as the last option for a control measure; after all other control measures have been explored and where it is not practicable to eliminate the exposure to the hazard.
2. In applications where exposure to occupational health agents is reasonably expected, testing and monitoring must be conducted to evaluate the exposure.

5.17 RESPIRATORY PROTECTION

1. Pre use inspections are required.
2. Personnel wearing respirators must be clean shaven or ensure that facial hair does not impede the proper seal of the respirator.
3. Qualitative fit testing must be performed by a competent person.
4. A 'fit check' must be performed by the respirator wearer each time the respirator is to be used.
5. Selection of respirators and cartridges is based on the hazards to which the worker is potentially exposed.

Cartridge Type	Colour
Organic Vapour/Acid Gas	Yellow
Organic Vapour only	Black
Dust/Particulate/Aerosols	Purple
Ammonia, Amines	Green
Acid Gas	Light Gray

See Section 5.1.6

See BM-P13 Respiratory Protection Program

5.18 NOISE EXPOSURE

1. Hearing protection is required in work areas where noise exceeds 85 dBA.
2. Noise surveys may be required to identify work areas where noise exceeds 85 dBA.
3. Selection of hearing protection is based on the hazards to which the worker is potentially exposed.
4. A noise exposure hazard may exist if any one of the following conditions is observed:
 - a. Construction equipment driven by large or small engines.
 - b. Metal fabrication
 - c. Tool use (power, pneumatic, etc.)
 - d. Hammering
 - e. Surrounding environmental conditions (airplanes, enclosed space, open space, reflective surfaces, etc.)

Source/Situation	Typical Sound Pressure Level (dB)
Hearing threshold	0 dB
Audible whisper	30 dB
Microwave oven	58 dB
Normal conversation	60 dB
Curbside of busy road	80 dB
Forklift	87 dB
Power lawnmower	94 dB
Chainsaw, 1m/3ft distance	110 dB
Thunder	120 dB

Airplane taking off – close observer	120 dB
Pain threshold	120-140 dB

Selection of Hearing Protection & Occupational Exposure Limits

Maximum Noise Level	CSA Grade	CSA Class
≥ 85 dBA	1, 2, 3, or 4	C, B or A
≤ 95 dBA	2, 3, or 4	B or A
≤ 100 dBA	3 or 4	A
≤ 105 dBA	4	A
≤ 110 dBA	E or 4 earplug, + 2, 3, or 4 earmuffs	An earplug + A or B earmuff
> 110 dBA	3 or 4 ear plugs + 2, 3 or 4 earmuff and limited exposure time	An earplug + A or B earmuff and limited exposure

See Section 5.1.5

See BM-P14 Noise Exposure Program

5.19 WEATHER

5.19.1 Cold Stress

The cold can create a risk for workers who work outside or inside a cold temperature environment. The human body senses and compensates for temperature changes. When the body can no longer compensate for these changes, other procedures **must** be implemented – such as protective clothing, altered work procedures, artificial heat, or wind barriers, etc.

The **Wind Chill Index** is the best known and most used of cold-stress indexes. The wind chill index is not actually a real temperature but, rather, represents the feeling of cold on your skin and is expressed in temperature-like units. Everyone facing exposure to low temperature and high wind should consult the **Wind Chill Index**.

WIND CHILL CHART

T_{wc}		Air Temperature (°C)											
		0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55
Wind Speed (km/h)	5	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58	-58
	10	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63	-63
	15	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66	-66
	20	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68	-68
	25	-6	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70	-70
	30	-6	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72	-72
	35	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73	-73
	40	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74	-74
	45	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75	-75
	50	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76	-76
	55	-8	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77	-77
	60	-9	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78	-78
	65	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-79
	70	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80	-80
	75	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80	-80
	80	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-81

Low risk of frostbite

Moderate risk

High risk in 30 minutes of exposure

Very high risk in 5 to 10 minutes of exposure

Severe risk in 2 to 5 minutes of exposure

Extreme risk in 2 minutes or less of exposure

V_{10} = wind speed measured 10 metres above ground level

Causes of Cold Stress:

The ambient temperature and the wind chill are the major contribution factors of cold stress injuries. Other contributors are overtiredness, use of alcohol that may result with poor judgement, wet clothing either from contact with water or due to excessive sweating and susceptibility to the effects of cold due to a medical condition or medications.

Cold Weather-Related Injuries and First Aid Treatment:

1. Frostbite: It occurs when a body tissue freezes and often there is no pain. Common body parts that suffer from frostbite are the nose, cheeks, ears, fingers, or toes. Before frostbite injury results, the skin may be lightly flushed. It is confirmed that frostbite has set in if the skin turns white or grayish yellow in color.

Treatment

- Never rub the affected areas.
- Keep affected area warm.
- Give the injured a non-alcoholic warm drink.
- Place frostbitten area in warm water between 100° and 105°F (37.5° and 40.5°C).
- Once the injured area is warm, get the victim to massage the area.
- If feet are the affected area, do not let the victim walk. Place dry gauze between toes, to separate them.
- Keep affected areas elevated.
- Seek medical assistance right away.

2. Hypothermia: Hypothermia results when the body continues to lose heat and the core body temperature drops. Shivering is the one of first

warning sign of hypothermia. When the body core temperature continues to drop, the brain becomes less effective, causing speech impairment, memory loss, loss of physical abilities, collapse, and death finally. This is the body's way of attempting to produce more heat and it is usually the first warning sign of hypothermia.

If the body has gotten wet either through rain or submersion in water, the likelihood of hypothermia is increased.

Treatment

- Get victim medical assistance immediately. Get the victim out of the wind, snow, or rain. Make sure to retain their energy level and keep them alert.
- Replace with warm clothes and provide them with sweet non-alcoholic drinks.
- Progressively get the victim warm.
- Victim should be seen by a physician for other injuries may have resulted from hypothermia such as pneumonia and frostbite.

Stranded During a Storm in a Vehicle:

It is better to stay with the vehicle. Be careful of carbon monoxide if the motor is running. The insulation can be taken from vehicle seats and stuffed in clothing. If travel is in areas where storms are frequent, emergency supplies should be carried to meet any weather conditions (i.e., food, blankets, shovel, candles, and cell phone or communication device when possible). If a worker is traveling into remote areas, someone at the office should be aware of the travel plans (*Refer to Working Alone and Journey & Travel Management Standards*).

The dead air space between the warm body and clothing and the outside air is essential. Many layers of light clothing with an outer shell of wind-proof material maintain body temperatures much better than a single heavy outer garment worn over ordinary indoor clothing. Make sure clothing allows some venting of perspiration. Wet skin will freeze more rapidly than dry skin.

Because metal will conduct heat away from the body quite rapidly, be careful of skin contact with metal objects.

5.19.2 Heat Stress

Normal body temperature is 37°C (98.6°F). A healthy person acclimatized to his or her environment can maintain a normal temperature by conserving heat in the cold and by dissipating heat when it is hot.

When a person is in poor health or is exposed to extreme heat, maintaining a temperature balance stresses the body. Prolonged exposure can cause heat cramps, heat exhaustion or heatstroke.

A healthy person adapts more readily to hot climates, but everyone needs to moderate physical activities, maintain body fluids, and guard against over-exposure. Where the potential to heat stress is possible, procedures may need to be developed and implemented including administrative (work-break scheduling)

Humidex ratings are used to inform the public when conditions of heat and humidity are uncomfortable or potentially dangerous.

Humidex Range	Degree of Comfort
20-29 °C	Little discomfort
30-39 °C	Some discomfort
40-45 °C	Great discomfort; avoid exertion
46 °C and over	Dangerous; possible heat stroke.

Heat-related illnesses depend on many workplace factors, in addition to the air temperature and humidity. Wind speed or air movement, workload, radiant heat sources, and a person's physical condition are important.

The following chart shows recommended response plans based on humidex ratings.

Note: This table serves as a guideline only. Thorough workplace-specific assessment is required.

Humidex 1 – Moderate physical work for unacclimatized workers OR Heavy physical work for acclimatized workers	Response	Humidex 2 – Moderate physical work for acclimatized workers OR Light physical work for unacclimatized workers
Humidex in °C		Humidex in °C
25-29	- Supply workers with water on an 'as needed basis'	32-35
30-33	- Communicate Alert for Heat Stress -Encourage drinking extra water -Record hourly temperature and relative humidity	36-39
34-37	- Communicate Warning for Heat Stress -Notify workers they need to drink extra water	40-42

	-Ensure workers are trained to recognize symptoms	
38-39	-Work with 15 minute relief per hour -Provide cool (10-15 °C) water At least 1 cup 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 provisions listed above	45-46
42-44	-If feasible, work with 45 minutes relief per hour can continue in addition to the	47-49

	provisions listed above	
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”

Summary of Control Measures for Heat Stress:

Reduce Body Heat Production	Mechanize tasks
Stop exposure to radiated heat from hot objects	Insulate hot surfaces. Use reflective shields
Increase sweat evaporation	Reduce humidity; use a fan where appropriate
Clothing	Wear loose clothing that permits sweat evaporation but stops radiant heat.
Acclimatization	Allow sufficient acclimatization period before full workload

Duration of work	Shorten exposure time and use frequent rest breaks
Water	Provide cool drinking water
Pace of Work	If practical, allow workers to set their own pace of work.

What is Acclimatization?

The body adapts to a new thermal environment by a process called acclimatization. It is the beneficial physiological adaptations that occur during repeated or prolonged exposure to a hot environment.

Complete acclimatization typically takes 7-14 days.

Heat Related Illnesses:

1. Heat Cramps are painful muscle spasms of the legs and abdominal muscles. They occur when the muscle is dehydrated due to vigorous exercise.

Treatment

- Place the injured worker at rest in a cool place.
- Give the conscious person slightly salted water, and it may be repeated **once** in ten minutes.
- Transport to medical aid.

2. Heat Exhaustion occurs when excessive sweating causes a depletion of body fluids and when conditions prevent the evaporation of sweat to cool the body. This is a critical

occurrence that may cause the internal organs or the brain to shut down to protect themselves. All workers should be aware of the symptoms of heat exhaustion. The symptoms of heat exhaustion may include dizziness, fatigue, and slurred speech.

Treatment

- Place the injured person in a cool place with feet and legs elevated.
- Loosen tight clothing.
- Remove excess clothing.
- Give conscious injured person electrolytes (i.e., Sports Drinks, Juices etc.)
- Place unconscious injured person in recovery position.
- Monitor breathing.
- Transport to medical aid.

3.Heatstroke occurs when there is prolonged exposure to a hot environment with poor ventilation or overexposure to the hot sun. Sweating ceases, temperature rises rapidly and can be fatal unless the body temperature can be lowered to near normal. High body temperatures, fatigue, slurred speech, dizziness, and hot dry skin indicate heatstroke. In some cases, an injured person of heat stroke may begin to shiver. The high internal body temperatures may cause the internal organs and the brain to shut down to protect them against the heat.

Treatment

- Place person in a cool place.
- Remove excess clothing.
- Place person in bath or sponge with cold water.
- Monitor body temperature closely.

- Monitor breathing.
- Transport to medical aid in a cool conveyance.

For temperatures over 35 degrees (Celsius) Work Breaks shall be instituted to mitigate the risk of Heat related illnesses

5.19.3 Lightning

When lightning is present, or notification of its arrival is imminent, outdoor activities/tasks shall be suspended and workers shall remain indoors or seek shelter.

1. Outdoor shelter options (in order of most desirable to least desirable)
 - a. Inside structures
 - b. Underground shelters
 - c. Large metal-frame buildings
 - d. Large, unprotected buildings
 - e. Enclosed vehicles (metal tops/body)
 - f. Streets shielded by near-by buildings.
 - g. Dense woods
 - h. Unprotected buildings, tents, other shelters in low areas
2. Avoid the following:
 - a. Hilltops and ridges
 - b. Areas on top of buildings
 - c. Open fields
 - d. Pools and lakes
 - e. Near wire fences, overhead wires, and railroad tracks
 - f. Under isolated trees
 - g. Contact with or use of electrical

devices, telephones, and plumbing fixtures.

If someone has been struck by lightning:

1. Call 911 Immediately
2. Help the individual when it is safe to do so.
3. Begin CPR (It is safe to touch the person. The body does not retain an electrical charge).
4. Treat for shock (if necessary); lay the individual down with head slightly lower than the torso and legs).

When lightning has subsided, sufficient time has past since last strike [approx. 30 minutes], and it is safe to return to working outdoors the Supervisor or designated manager will give the workers the 'All Clear' message.

5.19.4 Wind

1. When wind speed (or sustained gusts) exceeds manufacturers guideline limits at the personnel platform, a competent person must determine if it is safe to proceed with aerial / lifting operation (or if already in progress, must be terminated).
2. Secure loose items on site by brining them indoors, or by tying them down.
3. Secure all latches, doors, windows, scaffolding, ladders, etc.
4. Be cautious when lifting large objects (such as plywood) as these objects can function as a sail.
5. Wind speed restrictions on machinery or equipment found in the manufacturer's guidelines must be followed.

5.20 CHEMICAL AND BIOLOGICAL HARMFUL SUBSTANCES

5.20.1 WHMIS/GHS

WHMIS 2015 (Workplace Hazardous Materials Information System) Is a Canada-wide system used to provide information about all chemicals used by workers on the job.

The main components of WHMIS are hazard identification and product classification, labelling, safety data sheets, and worker education and training.

WHMIS is for every worker's protection. WHMIS describes the danger of hazardous materials workers may use on the job and tells how to protect you from their hazards. These materials are called "hazardous products."

5.20.2 Cleaning Solvents and Flammables

Cleaning solvents are used in day-to-day construction work to clean tools and equipment. Particular care shall be taken to protect the worker and the environment from hazards that may be created from the use of these liquids. Wherever possible, solvents should be non-flammable and non-toxic. The supervisor shall be aware of all solvents / flammables that are used on the job and be sure that all workers who use these materials have been instructed in their proper use, and any hazard they pose. SDS sheets on all cleaning solvents shall be posted on site or readily accessible by all workers in contact with the chemical.

The following safe work practices apply when solvents/ flammables are used:

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 and in well-marked containers as per regulations.
4. Check toxic hazards of all solvents before use. (SDS).
5. Provide adequate ventilation where all solvents and flammables are being used.
6. Use goggles and/or face shields to protect the face and eyes from splashes or sprays.
7. Use grounded and bonded gloves to protect the hands. (Refer to SDS).
8. Wear protective clothing to prevent contamination of worker's clothes and skin exposure.
9. Respiratory hazards are to be controlled using ventilation. Where ventilation is not practicable, workers potentially exposed to airborne contaminants must wear respiratory protective devices and workers are trained on the selection, use, and care of respiratory protective equipment.
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 field use of solvents / flammables and are properly labeled.
12. In any building, except one provided for their storage, flammable liquids such as gasoline, benzene, naphtha, lacquer thinner, etc. **shall** be limited to five gallons, in UL / CSA/ANSI approved properly labeled containers.
13. Rule #12 does not apply to kerosene and cleaning agents of the "Stoddard" solvent

class, however, not more than one gallon of such liquids **shall** be kept in any open container. The container **shall** be provided with a proper cover and be kept securely covered except when in actual use.

14. Ensure all workers using, or in the vicinity of use or storage, are trained and certified in the Globally Harmonized System. Ensure all requirements are met.
15. Fire extinguishers shall be readily available while working with or near flammable or combustible materials. (Class B or ABC)

Disposal of waste shall meet all applicable legislation and client's environmental requirements.

5.20.3 Labels (Supplier and Workplace)

1. Product Identifier
2. Hazard Pictograms
3. Signal Words
4. Hazard Statements
5. Precautionary Measures
6. Supplier Identifier
7. Safe Handling Precautions
8. Reference to SDS

WHMIS 2015 Labels

- 1 Product Identifier**
The product name exactly as it appears on the container and on the Safety Data Sheet (SDS).
- 2 Hazard Pictograms**
Hazard pictograms, determined by the hazard classification of the product. In some cases, no pictogram is required.
- 3 Signal Words**
"Danger" or "Warning" are used to emphasize hazards and indicate the severity of the hazard.
- 4 Hazard Statements**
Brief standardized statements of all hazards based on the hazard classification of the product.
- 5 Precautionary Statements**
These statements describe recommended measures to minimize or prevent adverse effects from exposure to the product, including protective equipment and emergency measures.
- 6 Supplier Identifier**
The company which made, packaged, sold or imported the product, and is responsible for the label and SDS.
- 7 Safe Handling Precautions**
May include pictograms or other supplier label information.
- 8 Reference to SDS**
If available.











Supplier Label

1 Product K1 / Produit K1	
2  	
3 Danger	Danger
4 Fatal if swallowed. Causes skin irritation.	Mortel en cas d'ingestion. Provoque une irritation cutanée.
5 Precautions: Wear protective gloves. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Store locked up. Dispose of contents/containers in accordance with local regulations. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse. IF SWALLOWED: Immediately call a POISON CENTRE or doctor. Rinse mouth.	Conseils : Porter des gants de protection. Se laver les mains soigneusement après manipulation. Ne pas manger, boire ou fumer en manipulant ce produit. Concier verrouillé. Éliminer le contenu/conteneur conformément aux règlements locaux en vigueur. EN CAS DE CONTACT AVEC LA PEAU : Laver abondamment à l'eau. En cas d'irritation cutanée : Consulter un avis médical/procéder un médecin. Enlever les vêtements contaminés et les laver avant réutilisation. EN CAS D'INGESTION : Appeler immédiatement un CENTRE ANTIPISON ou un médecin. Rincer la bouche.
6 ABC Chemical Co., 123 rue Anywhere St., Mytown, ON N0N 0N0 (123) 456-7890	

Workplace Label*

1 Product K1
7 Danger
Fatal if swallowed. Causes skin irritation. Wear protective gloves (neoprene). Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.
8 See SDS for more information.

*Requirements may vary – consult your local jurisdiction for their requirements.

	Exploding bomb (for explosion or reactivity hazards)		Flame (for fire hazards)		Flame over circle (for oxidizing hazards)
	Gas cylinder (for gases under pressure)		Corrosion (for corrosive damage to metals, as well as skin, eyes)		Skull and Crossbones (can cause death or toxicity with short exposure to small amounts)
	Health hazard (may cause or suspected of causing serious health effects)		Exclamation mark (may cause less serious health effects or damage the ozone layer*)		Environment* (may cause damage to the aquatic environment)
	Biohazardous Infectious Materials (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

Workplace Labels- WHMIS 2015

- A hazardous product is delivered to the workplace in bulk and a supplier label is not available.
- The supplier label on a container of a hazardous product becomes unreadable, damaged, or detached, and a replacement supplier label is not available.

5.20.4 Safety Data Sheets

Every product that is classified as a potential “hazardous product” under WHMIS that is intended for use, handling, or storage in each workplace in Canada must have an SDS kept readily available for the workers.

1. Identification
2. Hazard Identification
3. Composition/Information on ingredients
4. First-Aid Measures
5. Fire-Fighting 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

Note: Every worker can and must protect themselves or others by:

- Practicing safe work habits
- Being informed
- Using personal protective equipment
 - Tyvek coveralls, rubber boots, rubber gloves, etc.
- Knowing emergency procedures
- Following first aid practices
- Avoid hand-to-mouth contact
- Proper hygiene and handwashing
- Keep cuts covered
- Remove contaminated work clothes before eating and leaving the site

Workers exposed to wastewater or raw sewage must follow required hygiene and PPE controls and should be aware of recommended vaccinations for this work, including Hepatitis A/B (Twinrix) and Tetanus & Diphtheria (Td), due to the increased risk of contact with pathogens.

5.21 ASBESTOS CONTROL

5.21.1 Asbestos Removal

Asbestos fireproofing and insulation can be found in many buildings. Disturbing this material during renovation, maintenance, or restoring can cause hazardous dust. Vermiculite, used in various situations is another source of asbestos exposure.

1. Request the building owner provide records of Asbestos or testing that has been conducted.
2. Where any material found on a job site appears to be or resembles asbestos, workers **shall** immediately stop work and notify their supervisor so that tests may be conducted to ascertain the nature of the material.
3. A trained person will put together a removal plan based on the type/amount of Asbestos that is identified.
4. Types of Asbestos include:
 - **Actinolite**: may be found in products such as cement, insulation materials, paints, sealants, and drywall.
 - **Amosite**: may be found in cement, chemical insulation, electrical insulation, fire protection, plumbing insulation, thermal insulation, tiles
 - **Anthophyllite**: may be found in some cement and insulation materials.
 - **Crocidolite**: may be found in cement, tiles, and insulation materials
 - **Tremolite**: may be found in paints, sealants, insulation, roofing, and plumbing materials.

5.22 HYDROGEN SULFIDE (H₂S)

Hydrogen Sulfide (H₂S) is a colourless gas that produces a rotten eggs odour. Exposure to the gas can cause irritation to the eyes and respiratory system.

1. All personnel shall be suitably trained in the proper identification of H₂S, as per the specific needs assessment.
2. Never attempt a rescue in an area that may contain H₂S without using appropriate respiratory protection and without being trained to perform such a rescue.
3. All maintenance areas known to or suspected of having an H₂S atmosphere shall be documented and communicated to the client and appropriate B&M workers.
4. All equipment used in any operations involving H₂S shall be routinely inspected, tested, and maintained.

5.23 LEAD

Lead is a heavy, soft, malleable, bluish metal. It is mined from the earth and once extracted and processed into its pure elemental form, it persists indefinitely in the environment.

Lead can often be found in paints and primers, roofing components, electrical conduits, electrical storage batteries, and plumbing materials.

1. A Control Plan/Guideline shall be established, communicated, and implemented for work with and/or near lead containing materials.
2. Respiratory protection must be worn during activities where exposure to lead is known or a potential.

5.24 SILICA

Crystalline silica is the primary component of many building materials, such as granite, sandstone, concrete, concrete block, cement, mortar, etc. It has also been found as a filler material in insulation. Exposure to airborne silica can occur when these building materials have been disturbed or turned into a powder. When silica is inhaled it is difficult for the lungs to remove the silica dust particles; over time this can cause silicosis, a form of cancer. When silica is absorbed, it can lead to scleroderma, a disease in which the skin becomes progressively hard and thickened.

1. Prevent silica from becoming airborne by using wet cutting methods and/or soaking the materials during cutting.
2. Use HEPA vacuums or water suppression

- to remove any silica present in the air.
3. The use of fit-tested respiratory protection is required when potential silica hazards exist.
 4. Where applicable, isolation of the emission source (physical separation).
 5. Do not smoke, drink, or eat in contaminated areas.
 6. Do not use compressed air, or dry sweep silica-containing dust.

5.25 ANHYDROUS AMMONIA

Anhydrous ammonia (NH_3) is a compound formed by the chemical combination of one part nitrogen to three parts hydrogen, and is the oldest, most efficient, and economical refrigerant known. Anhydrous Ammonia exists as both a liquid and a gas, and is colourless with a sharp, penetrating, and irritating odour.

1. Only trained and competent workers shall work with anhydrous ammonia.
2. An exposure control plan and anhydrous ammonia transport plan must be implemented.
3. No amount of anhydrous ammonia can be transported without a valid Transportation of Dangerous Goods training certificate, shipping documents and the use of placards on vehicles.

Refer to B&M Program – Anhydrous Ammonia for more information.

5.26 MATERIAL STORAGE AND HANDLING

5.26.1 Housekeeping

1. Work locations, vehicles and buildings **shall** be always kept clean and orderly.
2. Combustible materials such as oil-soaked rags and waste **shall** be kept in approved metal containers.
3. Flammable liquids such as gasoline, benzene, naphtha, paint thinner, etc., **shall not** be used for cleaning purposes.
4. All solvents **shall** be kept in UL/CSA approved, properly labeled containers. Paint thinners, Gasoline, benzene, naphtha, and other solvents of this class **shall** be handled and dispensed only from approved, properly labeled containers.
5. Floors and platforms **shall** be kept free of dangerous projections or obstructions, and **shall** be maintained free from oil, grease, or water. Where the type of operation produces slippery conditions, the area **shall** be cleaned immediately, or mats, grates, cleats, or other methods **shall** be used to reduce the hazard of slipping.
6. Materials and supplies **shall** be stored in an orderly manner to prevent their falling or spreading and to eliminate tripping and stumbling.
7. Emergency exits, stairways, aisles, permanent roadways, walkways, and material storage areas **shall** be identified and kept clear at all times.
8. Materials and supplies **shall not** be stored in walkways, access doors and fire exit or block access to fire equipment.
9. No clothing **shall** be allowed to hang on walls behind doors or in the space back of

switchboards. No matches **shall** be left in clothes placed in lockers. Rubbish and unused clothing **shall not** be allowed to accumulate in lockers.

10. Waste material and debris **shall** be removed from work and access areas on a regular basis or at least once a day. Waste material and debris **shall not** be thrown from one level to another, but be carried down, lowered in containers, or deposited in a disposal chute.
11. Nails protruding from lumber intended for re-use **must** be removed or bent over flush as soon as possible after initial disassembly.
12. Bungee type cords **shall** not to be used by workers.
13. Material **shall** be stored in such a way that it does not endanger workers. No storage of material or equipment under or in close proximity to energized overhead lines if the material or equipment must be moved by a crane or similar hoisting device.
14. Roll off containers and dumpsters shall be placed in a safe location on solid and level ground.
15. Avoid overfilling roll-off containers or dumpsters.
16. Do not climb into a roll-off container or dumpster to try and adjust materials.
17. Use the door to the roll off container or dumpster as primary access. Never throw materials in from the ground level. Ladders on the side of these containers are intended for viewing inside, and not used to load material.
18. Communicate/coordinate with the container provider to confirm that materials being disposed of are approved

with selected roll off container or dumpster.(e.g. hazardous materials)

5.26.2 Storage and Tool Maintenance

1. The company **shall** supply and maintain shop tools and all power equipment in good repair. The competent worker **shall** use such tools as outlined by the manufacturer's direction or company training. Workers **shall** visually inspect tools prior to use and tag any found to be defective. The supervisor must be made aware of the defective tools and arrange for repair or replacement. Defective tools must be tagged and removed from service.
2. Large tools **shall** be set up out of the way, so as not to create a hazard.
3. Various powered tools & equipment will require their own maintenance schedule based on manufacturer's recommendations or guidelines and **shall** be inspected at regular intervals and maintained in a safe working condition.
4. Workers operating powered tools & equipment **shall** inspect their tools & equipment before each use following established guidelines.

When selecting tools for jobs/tasks, ergonomics should be considered. Refer to the Black & McDonald BM-P23 Material Storage and Housekeeping program for further information.

5.27 EXTENSION CORDS

1. All portable extension cords when used on construction sites **shall** be of the outdoor type, rated for 300 volts, and have an insulated grounding conductor.
2. Defective cords **shall not** be used.
3. Extension cords **shall** be protected during use.
4. Extension cords used in hazardous areas or damp locations **shall** be protected by approved ground fault protection and special hazardous area approved connectors.
5. Never use cords without a ground pin.
6. Never remove the ground pin.
7. Inspect the cord for cuts, wear, exposed wires, and cracks prior to each use. Remove damaged cords from service.
8. Ensure extension cords on the ground are setup as to not cause a tripping hazard.

5.28 EMERGENCY RESPONSE

5.28.1 Pandemic Management

Regarding pandemic management, Black & McDonald's objectives are:

1. Reduce transmission of the virus or disease among employees, customers/clients, subcontractors, partners, and members of the public
2. Minimize illness among employees and all other stakeholders.
3. Identify and manage the risks to our critical business functions to:
 - a. Sustain service to our customers by maintaining, at minimum, mission critical operations and services.
 - b. Minimize business and social disruption and the economic impact of the pandemic.
4. Inform clients of our business continuity plan and communicate regularly during the pandemic.

Pandemic Management and Business Continuity Plans are comprised of four primary components: prevention/mitigation, preparedness, response, and recovery. These plans can/will be activated by the Crisis Management Team and can be triggered by:

- The World Health Organization (WHO) declares a Global Health Emergency, an Epidemic, or a Pandemic.
- Public Health Officials in Canada and/or United States announce a public health emergency at a level rating of Moderate

or High Risk.

- Regional Health Declaration

Black & McDonald will follow applicable public health requirements. For more information on your regions Pandemic Management Plan, contact your HSE Manager.

5.29 ENVIRONMENT

5.29.1 Environmental Planning & Site Preparation

Before work begins, projects must assess and plan for potential environmental impacts. This includes:

- Identifying environmentally sensitive areas (waterways, storm drains, vegetation, wildlife zones).
- Ensuring required permits, approvals, and erosion/sediment controls are in place.
- Establishing designated areas for material storage, waste handling, refueling, and spill-response equipment.
- Verifying controls for noise, dust, and emissions as required by local legislation or client expectations.

Supervisors must communicate site-specific environmental requirements during orientations and toolbox talks.

5.29.2 Environmental Event Management & Controls

Environmental events include spills, releases, unplanned discharges, damage to sensitive areas, wildlife encounters, and near-misses.

Controls may include:

- Secondary containment for fuels, chemicals, and lubricants.
- Proper handling, storage, and segregation of hazardous materials and waste.
- Use of drip trays, absorbents, spill kits, and designated washout areas.

- Stormwater protection measures (silt fencing, drain covers, berms).
- Dust suppression, noise control, and emissions reduction measures.

Workers must follow all posted environmental instructions and immediately report any condition that could impact the environment.

5.29.3 Spills

A direct or indirect discharge of a material, substance or mixture into the workplace or environment from a container, vehicle, or structure, which is abnormal in quality or quantity considering the circumstances of the discharge. The material, substance or mixture can be a:

1. Hazardous Material, including:
 - A hazardous product regulated by federal, provincial land territorial government WHMIS/GHS regulatory authorities in Canada/US; or
 - An unregulated material, substance or
 - mixture, which may be hazardous due to its known or believed ability to cause acute or chronic health effects for exposed personnel (e.g., unknown chemical mixtures or biological materials)
2. A material, substance, or mixture, which due to its properties, state, quantity, or location can:
 - Jeopardize the safety of any

person (e.g., bulk oil spilled on a passage); or

- Impair or endanger property, the workplace, environment, plant, or animal life; or
- Interfere with normal operations.

Spill Response:

1. De-Ignition/De-energize of ignition sources
2. Notify person(s) in direct area, Supervisor & HSE contact.
3. Cordon off the spill area.
4. If the spill touches skin, refer to MSDS/SDS or contact Supervisor for assistance.
5. If the spill can be cleaned up without professional assistance, do so according to MSDS/SDS procedures.
6. If the spill needs professional cleaning assistance, keep the area cordoned off until their arrival.

Always refer to your local legislation, environmental department, and report all environmental spills and releases to your supervisor and HSE contact.

5.29.4 Environmental Reporting

Environmental events must be reported to Black & McDonald promptly so appropriate action can be taken. Reporting includes:

- Spills/releases (regardless of quantity).
- Damage to protected areas or controls.
- Improper waste handling or disposal.

- Wildlife incidents.
- Client-reported or regulator-reported concerns.

Supervisors are responsible for notifying the HSE Department and completing required documentation. Additional regulatory notification may be required depending on the jurisdiction, client requirements, and severity of the event.

Examples may include:

- *Municipal or regional environmental departments*
- *Provincial/state environmental agencies*
- *Federal bodies such as Environment and Climate Change Canada or the U.S. Environmental Protection Agency (EPA)*

5.30 FIRE PREVENTION

5.30.1 Fires

Three elements must be present for a fire to occur:

1. Enough **Oxygen** to sustain combustion.
2. Enough **Heat** to reach ignition temperature.
3. Some **Fuel** or combustible material.

A fire is extinguished by removing one or more of these three elements from the combustion process.



5.30.2 Fire Extinguisher

Where fire and/or explosive hazards exist, fire extinguishers are required to be readily available, and workers are required to be trained in their use.

Where the capacity of the equipment is lesser than the fire present, workers are required to commence the emergency response plan for fires (including but not limited to sounding the alarm, contacting emergency services and evacuation of work area).

Types of Fire Extinguishers:

A - Ordinary Combustibles – Fires started with paper, wood, drapes, and upholstery require a Class A type extinguisher.

B - Flammable and Combustible Liquids – Fires

originating from fuel oil, gasoline, paint, grease in a frying pan, solvents and other flammable liquids require a Class B type extinguisher.

C - Electrical Equipment – Fires started with wiring, overheated fuse boxes, conductors, and other electrical sources require a Class C type extinguisher.

D - Metals – Certain metals such as magnesium and sodium require a special dry powder Class D type extinguisher.

A multi-purpose dry chemical labelled ABC puts out most types of fires: wood, paper, cloth, flammable liquids, and electrical fires.

Ensure you use the right extinguisher for the appropriate type of fire. All fire extinguishers shall be inspected monthly (at a minimum).

Using a Fire Extinguisher:

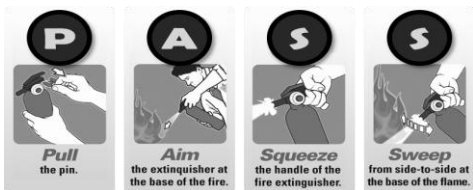
P *Pull* the pin, located at the top of the fire extinguisher. It is inserted into the handle to prevent accidental discharge.

A *Aim* the extinguisher nozzle at the base of the flames. Remember to keep the fire extinguisher right side up and perpendicular to the ground.

S *Squeeze* the trigger while holding the extinguisher upright.

S *Sweep* the extinguisher from side to side, aiming at the base of the fire. Cover the area of the fire with the extinguishing agent. Watch the fire area. If the fire re-ignites, repeat the process.

Note: Fire extinguishers are one element of a fire response plan, but the primary element is safe escape



The following are best practices for fire extinguisher use:

- Always read and understand the instructions on a fire extinguisher.
- Inspect the work area for flammable or combustible materials and ensure they're stored away from ignition sources.
- Maintain communication with others in the area and stop operations if a new fire hazard is identified.
- Return unused fire fighting equipment to its proper storage location.
- Dispose of used fire fighting equipment as appropriate.

5.30.3 Gasoline and Other Highly Flammable Liquids

1. **Shall not** be carried in the passenger compartment of a vehicle.
2. **Shall** be carried and stored in approved containers, with properly fitted caps, and **shall** be prevented from overturning.
3. **Shall** only be used with adequate ventilation.
4. **Shall** only be transported in vehicles equipped with a fire extinguisher.
5. **Shall not** be used as a cleaner.
6. Gasoline engines **shall** be shut off and allowed to cool before refueling.

7. When pouring or pumping gasoline or other flammable liquids from one container to another, metallic contact **shall** be maintained between the pouring and receiving containers. Portable fuel containers shall be removed from vehicles and placed on the ground before refuelling to reduce the risk of ignition due to static electricity.
8. Strict adherence **shall** be paid to “No Smoking” and “Stop Your Motor” signs at fuel dispensing locations.
9. Workers must not enter or remain in work area if more than 10% LEL of explosive substance is present in atmosphere.

5.31 FATIGUE MANAGEMENT

Fatigue is a state of mental and/or physical exhaustion that reduces a person's ability to perform work or tasks safely and effectively. If fatigue is identified as a risk to a worker's health and safety, suitable control measures must be implemented to minimize the risk.

Considerations must be paid to:

1. Repetitive or strenuous tasks
2. Temperature
3. Noise Levels
4. Vibration
5. Night shifts or alternating shift schedules
6. Extended shifts or overtime
7. Physically or mentally demanding work

To effectively control fatigue-based risk, the following measures should be implemented:

1. Elimination of safety-critical work between the hours of midnight and 6:00 am
2. Develop shift schedules and rotations that

minimize the effects of fatigue. These rotations should include scheduled breaks for rest and recovery during the work.

3. Ensure the work environment is not contributing to fatigue (e.g., proper lighting, temperature, noise)

5.32 JOURNEY MANAGEMENT

1. Vehicle use must be considered as part of all site and activity risk assessments undertaken to identify and assess potential hazards.
2. Drivers must ensure that:
 - a. Vehicle type is appropriate for intended use.
 - b. Vehicle is regularly maintained.
 - c. Speed limits, routes, and direction of traffic flow
 - d. Access to vehicles for emergency or security response
 - e. Names and details of travel party
 - f. Travel route
 - g. Road and weather conditions
 - h. Local/facility driving policies and procedures.
 - i. Requirements for reporting, recording, and monitoring vehicle movements (checks, call-ins, schedules, time of arrival, etc.)
 - j. Communication arrangements (and back up methods)
 - k. Navigation aides, GPS, maps, etc.
 - l. Fatigue management plans

5.33 WORKING ALONE

To work alone or in isolation means to work in circumstances where assistance would not be readily available to the worker:

- a. In case of an emergency; or
- b. In case the worker is injured or in ill health.

To determine whether assistance is “readily available,” ask the following questions:

1. Are other people in the vicinity?
2. Are those people aware of your worker’s need for assistance?
3. Are they willing to provide assistance?
4. Are they able to provide assistance in a timely manner?

Wherever possible, Project Managers shall plan the work to ensure workers do not work alone.

If Workers must work alone:

- a. Supervisors **shall** remain in contact with those they are responsible for and ensure all those who may be working alone are aware of the requirements for working alone.
- b. Supervisors **must** review the Working Alone Program on the Wire/SharePoint with the Worker who will be working alone.
- c. If a worker is contacted directly to report to an afterhours call, that worker **MUST** notify the call centre.

5.33.1 Call Centre Contact

Call in number: 1-844-525-2552

Email address:

cccemployee@blackandmcdonald.com

5.34 OFFICE SAFETY

5.34.1 General

1. Workers **shall** report all injuries, regardless of severity, to the person in charge.
2. Workers **shall** walk cautiously up and down stairs; the handrail **shall** be used whenever possible.
3. Caution **shall** be exercised when walking around blind corners.
4. Running is not permitted at any time.
5. Walkways **shall** be kept clear of materials or furniture that may cause tripping or act as a barrier to an egress.
6. Familiarize Workers of all exits and escape routes.
7. Parking lots **shall** be clear of slip, trip and fall hazards (i.e., potholes, cracks, ice, holes, and bumps).

5.34.2 Lifting and Carrying

1. A worker **shall** obtain assistance in lifting heavy objects.
2. Bulky objects **shall not** be carried in such a way as to obstruct the view ahead or interfere with free use of handrails or stairways.
3. Large boxes or bundles of supplies **shall** be moved by a hand truck or unpacked and delivered in smaller parcels.
4. Review SWP 5.9.1 Ergonomics/Lifting/Carrying.

5.34.3 Doors

Doors **shall** be opened slowly to avoid striking anyone on the other side of it.

5.34.4 Office Use Ladders

1. Workers **shall** use a set of steps or a ladder when required to place or obtain objects in elevated locations. *This applies to offices only.*
2. Material **shall** be piled in a stable manner.
3. Ladders and platforms **shall** be examined before use; treads and feet of ladder **shall** be provided with nonslip material.
4. Boxes, chairs, etc. **shall not** be used in place of ladders.

5.34.5 Sharp Instruments

1. Knives, scissors, letter openers, pens, and pencils, etc. **shall** be kept in front of desk drawer where they can be seen when drawer is opened.
2. Care **shall** be exercised when using staplers, punches, or paper cutters.
3. Immediate first-aid treatment is essential for all cuts and puncture wounds, no matter how minor.
4. All knives and/or blades used for cutting (box cutting, warehouse work, etc.) **shall** be self-retracting.

5.34.6 Filing Cabinets

1. Drawers of desks and file cabinets **shall** be kept closed when not in use.
2. Only one drawer of a file cabinet **shall** be pulled out at a time to avoid instability.

5.34.7 Fire Protection

1. No Smoking except in Designated Smoking Areas.
2. No smoking inside buildings where Municipal By-Laws apply.
3. No worker **shall** hinder access to fire extinguishers or exits.

4. Each worker **shall** note the location of fire extinguishers, exits, and fire alarms, and **shall** be knowledgeable in the use of each.
5. It is the responsibility of each fire warden to ensure that all workers are knowledgeable in fire protection and evacuation procedures.
6. Workers discovering fires **shall** sound the alarm:
7. Provided that the fire is of a small nature, the worker (if it is safe to do so) will attempt to extinguish it.
8. If there is any danger from this procedure, all workers **shall** evacuate the building immediately.
9. All workers **shall** exercise good housekeeping habits, not allowing waste, paper, rags, or other combustible material to accumulate.
10. Any waste material that may constitute a fire hazard **shall** be stored in covered containers.

5.34.8 Office Equipment

1. Unsafe electrical cords, faulty electrical or other equipment, or any other hazardous conditions **shall** be reported to your immediate supervisor.
2. Workers **shall not** attempt to clean oil or adjust any machine that is running.
3. If a running machine is not equipped with a starting switch that can be locked in the "off" position, it **shall** be disconnected from its power source.
4. Chemicals used in office copiers and similar **shall** be stored in proper containers in proper storage areas and handled with due care.

5. Appropriate personal protective devices (goggles, aprons, gloves) **shall** be worn when handling chemicals necessary for office functions.
6. Safety **shall** be considered in what the worker wears on the job. Loose fitting clothing, dangling bracelets, rings and ties **shall not** be worn and may cause serious injury to workers while operating or working around power driven machines (paper shredders, copiers, etc.).

5.34.9 Working in Outside Areas

Office workers called upon to work in the operating areas of the company (warehouse, back yard, etc.) **shall** observe the rules of that area (eye protection, hardhats, safety footwear, no loose sleeves, ties, and clothing regulations).

5.35 ILLUMINATION/LIGHTING

5.35.1 Illumination

Where natural illumination is not sufficient, artificial lighting **shall** be used. Temporary lighting (except battery powered) **shall** be protected with approved guards.

1. All areas where workers **must** work, pass through, or be present, including areas of access and egress, **must** be adequately illuminated.
2. Missing or burned-out light bulbs **must** be replaced.
3. Dark areas are not to be entered without the assistance of portable lighting or flashlights.
4. Head lamps for may be used for hard hats.

5.35.2 Lighting – Fixed/Temporary

This refers to the electrical system installed for the purpose of illumination during construction. Branch lighting circuits should be kept entirely separate from power circuits except for a common supply. Minimum temporary lighting requirements do not include provisions for portable handheld lamps used by various trades to illuminate their immediate work area.

1. Lamps should be installed in suitable locations to illuminate the entire area. Where this is not practical, additional light should be installed over and above the minimum requirements.
2. All temporary lighting is to be inspected regularly and burned out or missing lamps replaced promptly. Any lights that become obstructed by new work such as ceiling, ducts, piping, equipment, and partitions should be relocated.
3. Non-metallic sheathed cable of type N.M.W. 10 should be used for branch circuits providing it is not less than No. 12 A.W.G.

Copper or No. 10 A.W.G. Aluminum. Ensure that only Cu / Al receptacles and switches are used with aluminum conductors and that correct procedures are observed in making joints.

4. All lamp holders should be hard usage type, medium base sockets.
5. No. 10 cable should be secured to the structure by thermoplastic, insulated, solid wire on both sides of each light. The intervals between supports should not be more than 1.4 M (54”).
6. Each individual lighting branch circuit should be protected by a circuit breaker or fuse with a rating of 15 amperes and the total load per circuit should not exceed 12 amperes.
7. Lighting stringers should not be plugged into a receptacle but hard-wired directly into a distribution panel.

5.36 COMPANY VEHICLES

Definition of a Driver:

An assigned driver, an alternate driver other than the assigned driver, an occasional driver who drives less frequently, spouse/spouse equivalent that have access to a company vehicle, individuals who rent cars on business trips, subcontractors, employees that are provided a car allowance and someone who drives their own vehicle while on company business.

In the Event of an Accident/Incident:

- Contact National Leasing Company (NLC)
- Provide all information relevant to NLC representative.
- Contact Supervisor/Manager
- Do not attempt to drive if an injury is sustained.
- Do not attempt to drive the vehicle if there has been visible damage to the vehicle.
- NLC will provide information on next steps (towing, rental car, transportation etc.)
- All accidents/incidents must be investigated using the Incident Investigation form.

5.36.1 Drivers of Vehicles

1. Drivers of all Black & McDonald vehicles and vehicles on property **must** “back in” when parking, unless otherwise indicated.
2. Bungee type cords **must not** be used for securing materials on any vehicle.
3. When securing materials on vehicles, do not throw the tie down strap to the other side.
4. Secure all interior tools and materials using cargo nets or other approved restraint systems. Light trucks must have

- a rear-seat cargo net or barrier installed when storing tools inside the cab.
5. Commercial drivers are required to maintain accurate logbook entries.
 6. Drivers will have a First Aid kit and Fire Extinguisher (2.5, 5 or 10 lbs.) in vehicles in cases of emergency.
 7. Workers **shall not** smoke in any company vehicle.
 8. For more information, please refer to the Black & McDonald Driver's Manual.

5.36.2 Trucks

1. Trucks **shall** be positioned on terrain as level as possible for loading or unloading.
2. Where view is obstructed, a competent signal person **shall** direct a truck backing up.
3. Truck wheels **shall** be blocked or chocked when loading or unloading.
4. There **must** be an audible back-up signal if the vehicle is greater than 1-ton.
5. Drive through operation shall be arranged where possible.
6. The use of a reverse alarm shall be used when reversing a vehicle. If the vehicle is not equipped with an alarm, the driver should honk the horn twice before proceeding.
7. If truck has been outfitted with accessories such as trailers or ladder racks, items must be inspected for load securement.
 - a. Loads shall be secured using properly rated tiedowns, positioned and blocked to prevent movement, and

inspected before travel and during transit as required.

8. Maintain 3 point contact when entering and existing vehicles.

5.36.3 Use of Crash Vehicles

1. Crash vehicles may be required and used during street or highway works to block any out-of-control vehicle that may strike the workers involved.
2. Crash vehicles **shall** be used in conjunction with temporary workplace signs, barricades, and flashing lights as per the authority having jurisdiction. The crash vehicle is positioned so that any out-of-control vehicle will crash into it stopping progress of the vehicle.
3. Safe Work Practice When Using Crash Vehicles:
 - a) Ensure the arrow board is set up and operating before entering the roadway.
 - b) Position the crash vehicle to provide a large buffer zone between it and the work zone. It must be clearly visible to all approaching traffic.
 - c) Apply parking brake and activate four-way flashers on crash vehicle.
 - d) The crash vehicle operator **must** wear appropriate PPE and should not remain inside the vehicle while it is parked.
 - e) All works on public roadways **must** comply with the local Traffic Control Regulations for the area where work is being performed.

5.36.4 Trailer Towing

1. Only competent employees are permitted to tow trailers.
2. Always complete a documented pre-trip inspection on your trailer and towing vehicle. This includes checking safety chains, pins, straps, and any connection points.
3. Make sure your trailer and whatever is being hauled fall within the towing or hauling capacities of the vehicle. Check owner's manual to find trailer types that the vehicle can haul and the maximum weight it can pull.
4. Review the trailer manufacturer's recommendation prior to towing. Some trailers are not meant to be towed long distances, and it may have a maximum speed limit.
5. If renting a trailer, ensure to complete and obtain a renter's documented inspection.
6. Distribute weight evenly on the trailer.
7. Ensure trailer lights work – Connect the brake and signal lights. Double check to make sure the trailers brakes, turn signals, and taillights are all synchronized with the tow vehicle.
8. When towing, be sure to adjust driving practices accordingly. Avoid sudden turns and stops.
9. Follow all local motor vehicle requirements for specific conditions and classes of towing
10. Secure loads with ratchets from the passenger side as to avoid line of traffic if/when readjusting.
11. Ensure cargo is secured to prevent movement in all directions—forward,

backward, sideways, and vertically.

12. Remove from service any tiedown that is cut, frayed, deformed, or missing a WLL tag.

5.36.6 Vehicle Inspections

1. Pre-use visual inspections shall be completed prior to operating a vehicle.
2. Drivers of company and personal vehicles are required to perform and document a thorough weekly circle check.
3. Any deficiencies found shall be communicated to the direct supervisor.

5.37 TRANSPORTATION OF DANGEROUS GOODS

5.37.1 Classes of Dangerous Goods

Dangerous goods are divided into nine (9) classes:

Class 1 - Explosives

Class 2 - Gases

Class 3 - Flammable liquids

Class 4 - Flammable solids

Class 5 - Oxidizing substances and organic peroxides

Class 6 - Poisonous and infectious substances

Class 7 - Radioactive materials

Class 8 - Corrosive substances

Class 9 - Miscellaneous dangerous goods



5.37.2 General Requirements

1. Transporting these goods under the regulated limit in service vehicles is exempt from the following guidelines.
2. Only workers who are trained or are under the direct supervision of a trained person may handle or transport any dangerous goods relative to their assigned duties.
3. All trained workers will be issued a certificate of training.
4. Certificate of training **must** be renewed every three years, and a record **must** be kept for five years by the trainer.
5. The shipper **shall** ensure that the shipping document contains all the required information.
6. The carrier **shall** ensure that the document accompanies the consignment.

7. The driver **shall** ensure that one copy of the dangerous goods document is kept in a pocket mounted on the driver's door.
8. Dangerous goods transported in a van or pick-up truck **shall** be accompanied by the proper documents as required under the Transportation of Dangerous Goods Act.
9. No person **shall** transport dangerous goods that are contained in a cylinder unless the cylinder is securely stored in, or on, that means of transport.
10. Transportation of large quantities of hazardous goods **shall** be done by an approved carrier (i.e., have the supplier deliver to site).

5.37.3 Compressed Gases

1. Care **shall** be exercised in handling all compressed gas cylinders. They **shall not** be dropped, jarred, or exposed to extreme temperatures.
2. Cylinders **shall** always have the valve cap or valve protection device in place except when in actual use.
3. Cylinders **shall not** be rolled and **shall not** be lifted by the valve or valve cap; a suitable cradle or other device **shall** be used.
4. Compressed gas cylinders, whether full or empty, **shall** be stored or transported in an upright position and chained or otherwise secured so they cannot fall or be upset.
5. Oxygen cylinders in storage **shall** be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum distance of 6M or by a 1.5M high non-combustible barrier.
6. Cylinders **shall not** be placed where they might become part of an electrical circuit.
7. Hydrogen and fuel-gas cylinders **shall not** be stored inside any operating building. Separate storage buildings or sheltered storage areas **shall** be used.
8. Workers **shall** never force connections that do not fit, nor **shall** they tamper with the safety relief devices of cylinder valves.

5.37.4 Oxygen and Acetylene

1. Leather gauntlet gloves and goggles with the proper shade of lens **must** be worn by workers using an oxyacetylene cutting torch.
2. Oxygen and acetylene **shall** be stored and transported in a secured upright position.
3. Cylinders **shall** be stored in a well-ventilated area with an overhead cover to protect from the weather.
4. Protecting caps **shall** be in place when cylinders are moved or are not in use.
5. Cylinders **shall** be racked when being hoisted.
6. Leaking gas cylinder **shall** be shut off, placed outdoors, and reported to the supervisor.
7. Keep away from heat over 54°C (130°F).
8. Empty cylinders **shall** be stored apart from full ones.
9. Check joints with soapy water or commercial leak detector when connecting regulators to cylinders. If a leak is found, remove the cylinder from the area or building and away from all possible sources of ignition. Tag the cylinder, explaining the nature of the problem.
10. Oil, grease, or similar materials **shall not** be allowed to come in contact with any valve, fitting, regulator, or gauge on oxygen cylinders.

5.37.5 Propane

1. Propane is heavier than air (specific gravity greater than 1.00) and will settle in low areas such as trenches, utility access holes and sumps. The bottles **shall** be

- checked for leaks and low-lying areas **shall** be analyzed for build-up of gas.
2. Cylinders **shall** be kept upright unless designed for horizontal use.
 3. Cylinders **shall** be stored in a well-ventilated area away from heat.
 4. Only approved hoses and fittings **shall** be used.
 5. Always use soapy water or commercial leak detector when checking for leaks in propane systems prior to use.

5.37.6 Hydrogen

1. Special precautions **shall** be taken when using hydrogen to avoid the possibility of fire and explosions.
2. "DANGER - NO SMOKING" or "OPEN FLAMES" signs **shall** be posted where hydrogen is used or stored.

5.37.7 Chlorine

1. Chlorine containers **shall** be stored and properly secured in a cool place and protected against moisture.
2. Every precaution **shall** be taken to prevent accidental discharge of the gas.
3. Protective equipment **shall** be readily available for use in an emergency.
4. Chlorine cylinders **shall** never be used or stored near flammable materials.
5. Should a chlorine leak develop, the cylinder **shall** be placed so that only "gas" escapes. (An ammonia swab may be used to detect leaks.)
6. Water **shall** not be sprayed or poured on chlorine leaks.

5.37.8 Nitrogen

1. While nitrogen is not toxic or flammable, it could be hazardous if large quantities

were present in confined spaces (this is true of most gases). Some large transformers are shipped from the manufacturer charged with nitrogen.

2. Personnel entering a confined space would be faced with an atmosphere lacking in oxygen unless fully ventilated as per Section 6.27 - Work in Confined Spaces of this handbook.

5.37.9 Ammonia

1. **Shall** be stored in an area that is: cool, dry, out of direct sunlight and away from heat and ignition sources, separate from incompatible materials, secure, and separate from work areas, an approved, fire-resistant area.
2. Store in the original, labeled, shipping container.
3. Always secure (e.g., chain) cylinders in an upright position to a wall, rack, or other solid structure. Empty containers may contain hazardous residue.
4. Immediately report leaks, spills, or failures of the safety equipment (e.g., ventilation system). In event of a spill or leak, immediately put on escape-type respirator and exit the area.
5. Do **NOT** work alone with ammonia at any time.
6. Wear chemical safety goggles or a face shield (with safety goggles), based on the hazards present.
7. Chemical protective clothing e.g., gloves, aprons, boots is required.
8. Workers **shall** wear a NIOSH approved air-purifying respirator with an appropriate cartridge, a NIOSH approved self-contained breathing apparatus (SCBA) or supplied air respirator based on the ppm level (250 or greater)
9. An Ammonia Gas Personal Monitoring Detector is recommended.
10. Ammonia is very toxic and very corrosive and should always be treated with care and control.

5.38 TRAFFIC CONTROL

When construction, maintenance, or utility activities interrupt the normal operating conditions of a street, parking lot or highway, traffic control provides for the continuity of movement of motor vehicles, bicycles and pedestrian traffic and protects workers in temporary workplaces from errant vehicles.

1. Never start or continue work if the safety of either motorists or workers is jeopardized.
2. Every temporary workplace traffic control zone must be designed considering worker safety, road user safety, the efficiency of traffic flow at all stages of the project, and local requirements.
3. When applicable, the need for a traffic control plan shall be assessed based on the work activity and hazards present.
4. When required, buffer vehicles shall be used to protect workers during road work and/or block other vehicles from encroaching the established work zone.
5. When creating a plan to manage traffic, individuals involved shall be aware and implement the legislative requirements within the jurisdiction where the work is being completed.
6. Typical hazards to assess (including, but not limited to):
 - a. Road Constituents (Asphalt, Rock, Clay, Sand, etc.)
 - b. Road Orientation (Curved, Straight, Slight Bend)
 - c. Sight Hindrances (Affecting visibility)
 - d. Speed limit
 - e. Type of road/location

- (Single/Multi Lane, Divided/One way road, Highway/Freeway Intersection, passing over or near waterways, railways, etc.)
 - f. Peak Traffic Time (Note: do what you can to avoid these times or limit the restricted space.)
 - g. Weather conditions
 - h. Time of day (Traffic, Day, or Night work)
 - i. Short-term, Long-term Road work
7. Signaler(s) or sign person(s) shall be trained to conduct the task and shall have all the required tools to perform the task safely.
 8. Communicate and clarify with local authority (city, town, law enforcement) before proceeding with any work.
 9. At no point should any worker impede into traffic and **shall** always stay in the designated working area.
 10. Assessment of traffic control person placement shall be made prior to commencement of work (i.e., speed, visibility of signage, visibility of workers, line of sight)
 11. Never trust that vehicles can see workers or will stop when required.

5.39 KNIVES

1. Knives **shall not** be used unless there is no alternative tools or equipment available for the task.
2. When a knife must be used, select the correct knife for the task.
3. Only use the knife for the purpose it was designed for. *For example: a knife should*

not be used as a pry bar, can opener, chisel, punch, scraper, or screwdriver.

4. Knives shall be inspected prior to use to ensure it is sharp, and not damaged or defective.
5. Supervisors must be advised when a knife is damaged or defective.
6. Blades must be replaced or sharpened when dull.
 - a. Damaged or defective blades must be appropriately disposed of.
7. Do not use excessive force to make a cut.
8. Store knives with the blade retracted or covered/protected.
 - a. *Self-retracting blades are preferred.*
9. Do not cut towards yourself and keep hands and body out of the path of the cut.
10. Cut on a stable surface. Use a vice or mechanical device to secure the material being cut whenever possible.
11. Cut resistant gloves **shall** be worn when using a knife or handling material with sharp edges.
 - a. At a minimum, cut level 3 shall be worn.
12. A Safe Job Procedure **shall** be written prior to the use of a knife to ensure all hazards have been identified and controls implemented.
13. Regardless of a safe work procedure, the following knives are **prohibited** from use:
 - All knives with “breakaway” blades
 - Switch blades
 - Others prohibited by local legislation.

Scan for additional employee resources

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- Employee Assistance Program information
- Safety Moments and Toolbox Talks
- Vehicle Incident Reporting Procedure
- Black & McDonald Regional Contact Information
- eCompliance Support
- Working Alone Procedure
- OH&S Legislation/Regulations
- Glove Selection Guidance
- HSE Policies and Programs

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