

# Winter Works Best Practice

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# Winter Work Best Practice

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Winter conditions in Alberta can start as early as October and continue through to April. Weather and environmental conditions during this time create hazards. If uncontrolled, these hazards can increase the risk of loss to people, equipment, materials, production and the environment.

## **1.0 Purpose**

The purpose of this best practice is to provide guidelines to follow when developing a winter preparedness program specific to the company or site requirements.

This best practice will:

- Raise awareness and provide mitigation strategies to reduce the risks associated with working in winter conditions
- Provide a comprehensive guide on winter work preparedness, awareness and implementation
- Propose a schedule for pre-season, in-season and post-season activities
- Promote continuous improvement through post-season review, carrying lessons learned forward to the next year
- Provide a tool kit that contractors can use when developing their own winter work program including templates for Winter Work Plans, schedules, forms, checklists, posters and training materials

## **2.0 Scope**

This document will cover pre-season planning, in-season work execution and, post season de-winterization and review. This document will provide guidance to minimize the impact on people, environment, materials, production and equipment by focusing on three main topics:

- Site Preparation and planning
- Winter driving and equipment operation
- Winter PPE

By focusing on these three areas, companies will have the best chance to eliminate or mitigate the risks associated with winter hazards, ultimately reducing loss.

## **3.0 Project Planning and Site mobilization**

Winter preparations should start during project planning and site mobilization.

### **3.1 Project Planning**

During the initial bid and contract preparation phases, winter condition requirements must be accounted for. Minimizing the impact of winter hazards will require more resources including people, materials and equipment. Production during winter conditions may also be lower due to cold temperatures and heavy snowfall. Initial planning will help to mitigate the impacts winter weather and environmental conditions may have on the project.

Some work may be more difficult to complete during winter conditions such as earthworks. Consider these job tasks when determining the work schedule. Also consider limitations of required equipment. For example, some equipment can not operate at low temperatures. If equipment will be affected by winter conditions, arrangements can be made, such as selection of different equipment, during the planning phases. Taking this into consideration can prevent future incidents and production delays.

Planning for winter conditions should also be considered when obtaining bids and awarding work to subcontractors. Winter condition requirements must be communicated to the subcontractor by the prime contractor. Responsibilities must be established before the subcontractor begins work. Responsibilities may include but aren't limited to work area and equipment winterization, snow removal and grit application and supplying PPE.

### **3.2 Site mobilization**

During site mobilization, the configuration of the site should accommodate winter requirements. If possible, the site configuration should place offices, lunchrooms, laydown areas and work areas on higher ground than snow storage locations. Drainage should direct snow melt away from roadways and walkways. This will help to eliminate ice formations during freeze thaw cycles. Many incidents occur due to not planning for water accumulation.

During the initial set up of the site, roadways, walkways and parking areas should be designed to minimize human machine interface to reduce the risk of vehicles and equipment contacting pedestrians. Elevating roadways, walkways and parking areas will prevent water from accumulating. If elevation is not possible, drainage, ditching or berming should be in place to prevent water accumulation in low lying work areas, laydowns, roads and parking areas. Water accumulation can freeze creating a slippery ice hazard. When determining speed limits for roadways, keep in mind these may need to be adjusted for winter conditions.

### **4.0 Schedule of Activities**

Various activities must be completed throughout the year to prepare for and handle winter conditions. Having a planning schedule will help to ensure all activities are completed in time to enable safe work execution.

Activities may vary depending on the site. Appendix 1 shows a calendar of events for sites that have completed a winter season. Appendix 2 shows the calendar of events for new sites that will be preparing and entering the winter season for the first time.

### **5.0 Pre-Season Planning**

The following sections provide pre-season planning activities to assist in shifting from summer work to winter conditions on both new and existing sites.

## 5.1 Winter Safety Kick-off Meeting

To commence planning for the winter season, a Winter Safety Kickoff Meeting should be held to discuss pre-winter activities that will be completed prior to winter conditions arriving. This meeting should take place in August and should involve parties responsible for the following:

- Construction management/ Client
- Safety
- Equipment and vehicle maintenance
- Snow removal and road maintenance
- Building maintenance
- Dewatering
- Procurement
- Preservation
- Lighting
- Heating and hoarding
- Subcontractors

When creating the meeting agenda, all parties should be provided the opportunity to review and update the agenda to ensure no items are missed. Meeting minutes should be documented and should include required actions, parties responsible and completion dates (see Appendix 3 for an agenda template).

## 5.2 Hazard Assessment Tools

It is important to update written hazard assessment tools with winter hazards.

The production schedule will identify what work activities will be performed during the winter months. From this schedule, jobs that require written job hazard analysis, job safety analysis or safe work practices and procedures can be updated to include any winter hazards that may impact these work tasks. These updated documents should be reviewed with the work force prior to work commencing during winter conditions.

Planning is the best way to ensure risks associated with winter hazards are minimized. When completing hazard assessment documents, use the hazard control hierarchy as you would for any other hazard. For example, cold temperatures are one of the main hazards presenting risk of injury to workers during the winter season. Minimizing cold exposure and protecting from the wind are the most effective ways in preventing cold injuries. Warm up breaks should be used in combination with winter PPE. Appendix 4: Wind Chill Chart and Appendix 5: Cold-Exposure Guidelines for Outside workers can be used when determining warm up break schedules.

Other than the cold, hazards that present a risk of injury to workers or damage to property and equipment may include:

- Slippery ice or compact snow leading to slips or reduced traction
- Poor driving conditions and unclear roadside delineation.
- Falling snow and ice from overhead (ie. roof tops)
- Blowing snow reducing visibility
- Inadequate lighting for the task

Winter hazards should also be included on the field level hazard assessment (FLHA). Winter awareness campaigns for the work force will inform workers of winter hazards and controls required to mitigate the risk. Campaigns will provide workers the information needed to implement controls and create thorough FLHA cards. Winter awareness campaigns are discussed below.

## **5.3 Site Planning and Preparation**

The sections above discussed initial site design and set up. The following sections provide guidance on preparing work sites for winter conditions after the initial site set up is complete.

### **5.3.1 Roadways, Walkways, Parking Areas and Work Surfaces**

Prior to the winter season, roadways and parking areas should be maintained so they are free of pot holes and uneven surfaces. Once the ground is frozen, road maintenance will be more difficult. Also, starting with a well maintained road will make snow removal and road maintenance easier once winter conditions arrive. Any holes, excavations or ditching that can not be filled in should be delineated using barricades or berms and marked.

### **5.3.2 Snow Removal, Sanding and De-icing**

As part of the pre-season planning process, areas where snow removal will be required, snow removal methods and, snow removal crews must be determined. On multi-prime contractor sites it is important to define areas of responsibility. Creating a map that indicates each prime contractor's assigned areas will ensure no areas are missed. Areas to consider for snow removal are:

- Roadways
- Parking areas
- Pedestrian walkways
- Stairs and ladders
- Access/egress to building's utilities, temporary power, heating and lighting for maintenance and fueling
- Elevated work locations

These areas should be prioritized to ensure critical areas such as emergency response routes and high traffic areas are cleared and maintained first during heavy snowfall. To minimize the impact of snow accumulation, snow clearing should be completed as the snow falls and prior to work commencing. Night shift snow removal crews may be required to avoid production delays on day shift.

Equipment should be available for snow removal prior to the winter conditions arriving. When selecting equipment for snow removal also determine safe zones for all mobile equipment. This safe zone will indicate the proximity each specific piece of equipment can come to structures, buildings and other equipment. Safe zones can be indicated with barricading around buildings and structures or with an indicator placed on the equipment its self. This will minimize the risk of equipment contact. All snow required to be

removed inside the safe zone must be removed by smaller equipment with a smaller safe zone or manually with shovels.

Using competent spotters will help to mitigate the risk of equipment coming in contact with personnel, equipment or structures during snow removal in congested areas. A traffic management plan may be required for snow removal in high traffic areas.

Where manual snow removal is required, worker selection and ergonomics should be considered. Manual snow removal is strenuous, repetitive work that can lead to musculoskeletal injuries.

All workers required to perform snow removal activities, manual or by mechanical means, should be trained and deemed competent prior to performing their tasks. To ensure crews are prepared for the winter season, training and competency checks should occur in September to early October. Also, spotter training and competencies should be completed at this time for any workers that will be required to assist with spotting snow removal activities.

It is important to identify what tools and equipment will be required for snow removal and compare that to inventories on site before first snow fall. To determine what stock may be required for new sites, compare to similar sized projects on other sites. Procurement of required tools and equipment can take time. Also, supplies may be limited as many companies may need to acquire the same supplies. To ensure supplies arrive prior to first snow fall, procurement should take place early, September at the latest. Tools and equipment that may be needed are:

- Grader
- Front end loader
- Skid steer or bobcat
- Snow blower
- Leaf blowers
- Shovels
- Brooms (strong enough to move snow)
- Ice scrapers or chippers

Snow removal equipment creates extremely slippery surfaces after snow has been removed. To mitigate this, grit should be placed soon after the equipment has completed snow removal. Prior to winter conditions arriving, the amount of grit that will be needed for the duration of winter, where the grit will be obtained from and how long it will take to obtain the grit must be determined. Storage requirements of grit stock need to consider location, temperature and environmental.

When deicer will be used, site environmental requirements must be met. Some sites prohibit the use of deicers that are salt based as they can change the pH and conductivity of ground water. Grit and deicer as well as the equipment and tools



required to apply both should be ordered and onsite prior to first snow fall, usually in September.

Small amounts of grit and deicer should be stored throughout the work areas for convenience. This can be placed in a box to keep the material from freezing and free of snow. Pairing a shovel with the box will allow for easy application of the material. Keeping boxes filled with stock must be an assigned task to ensure it is completed. For large sites a refill schedule may be helpful to maintain stock.

Snow dump locations for roadways, walkways and parking areas should be selected so they are convenient but not situated so visibility in the area is inhibited. Temporary snow storage areas may be created where snow can be compiled and transported to a centralized snow dump. If temporary snow storage areas are used, it is important to determine who will transport the snow from the contractor's snow dumps to the centralized site dump. When determining the location of snow disposal areas, site requirements must be considered. To avoid flooding during spring melt, snow disposal areas should not be placed on high ground.

### **5.3.3 Building and Trailer Winterization**

It should be established which buildings will be used throughout the winter and which, if any, will be unoccupied until spring. Even buildings that will be used continually during winter conditions may require winterization as freezing temperatures can cause damage to building utilities. Preparation must address both the interior and the exterior of the buildings.

Exterior considerations include:

- Snow removal requirements on decks, walkways and stairs
- Storage locations for deicer and grit
- "No slip" material on stairs and walkways.
- Hand rails on stairs
- Access/egress coverings to prevent snow build up and overhead snow and ice hazards in front of doors. Slope of the cover should be perpendicular to path of travel.
- Lighting
- Boot cleaners and brushes placed at entrances
- All doors and windows latch securely

Interior considerations include:

- Furnace cleaning and maintenance
- Piping systems
  - Heat trace with insulation or an anti-freeze treatment may be required to prevent freezing
- Floor mats and wet floors.

- Floor mats can assist in keeping wet surfaces at the entry way. Mats should have an anti-slip backing. Wet floor signs should be available to be placed at entry ways.

For buildings that will not be used continually throughout the winter season see the Holiday Shut Down section below.

### **5.3.4 Heating and Hoardings**

Hoardings are used to provide warm, dry work locations. They may be required to preserve equipment and materials or enable work that can only be conducted at warmer temperatures, such as curing concrete. When workers are required to work outdoors, hoardings can be used as warm up locations. When planning for hoardings, consider:

- Hoarding requirements including locations / work areas to be hoarded
- Materials needed: scaffolding, wood, tarps, insulation
- Heating demands to achieve temperature requirements. Use of indirect fire heaters will help prevent build up of carbon monoxide. Tiger torches **must not** be used as a heating source.
- Interior ventilation and air quality requirements. When combustion heaters may affect air quality, electric heaters must be used.
- Air movement within the hoarding.
- Number of workers required to use space for warm-up. Ensure hoardings will be appropriate size for all workers that will use the hoarding
- Potential fire hazards. Place heaters downwind of hoardings and use heater socks long enough that heaters are not in direct contact with any combustible or flammable material.
- Hoarding inspection frequency to monitor for snow build up and stability

Fuel requirements must be established if diesel or propane heaters will be used. When determining fuel requirements also consider supplier delivery frequency and quantities that will be required to be stored on site. Storage must meet or exceed WHMIS and TDG as well as site and regulatory environmental requirements.

### **5.3.5 Lighting**

Daylight hours are reduced in winter months. Depending on your geographic location, daylight hours can be as short as 9 hours in southern Alberta to 7 hours in Northern Alberta. To mitigate the risk associated with low light levels, the following should be considered:

- Light level required to complete work
- Tasks to be conducted during non-daylight hours. Critical tasks, such as critical lifts, are to be scheduled for daylight hours
- Type of lighting that will be installed. In permanent work areas such as laydowns and office areas permanent lighting maybe more practical. In temporary work areas, portable lighting may be suitable.

- Light placement. Pay particular attention to illuminating walkways and pedestrian crossing. Watch for the creation of shadows
- Barricading around light installation

When light plants are used as a temporary light source, it is important that the workers required to set up the light plant are trained and competent. Severe injuries can occur when setting up light plants, especially when raising and lowering the mast. To reduce the environmental impact, a schedule should be created and implemented indicating times the light plants can be shut off. Areas around light plants should be maintained to allow for safe access and egress for fueling and service. Light plants must only be used according to manufacturer's specifications.

It is important to ensure areas that do not require a light source have hazards identified with reflective barricades or marking. Also, signage in these areas should be made of a retro-reflective material. This is especially important for traffic signs. If the signage can't be made of retro-reflective materials, consider placing blinking lights to increase visibility.

### **5.3.6 Excavations**

Snow cover can hide leading edges of excavations causing deep holes to look like shallow depressions. Snow and ice causes access/egress routes into excavations to become slippery. Before the winter season arrives, any unnecessary excavations should be filled.

The best way to prepare excavations for winter conditions is during the initial construction. When determining where spoil piles will be placed, also consider snow that will be removed from the excavation. Dewatering of ground water should be ongoing to prevent water accumulations that can freeze. If enough space is available, all excavations should be bermed. Berming creates a physical barrier preventing vehicles and equipment from entering the excavation. Berming should be marked with high visibility markers or blinking lights. When berming is not possible high visibility barricades should be placed far enough from the excavation to prevent vehicles and equipment from entering.

To prevent damage to excavating equipment, ground thaw units can be used for excavating required to be completed during the winter.

### **5.3.7 Pre-Season Hazard Identification**

To prepare for typical winter conditions in Alberta, a formal inspection starting in September of each year should take place to ensure the work areas are ready for winter conditions. This inspection should be conducted on all active worksites or worksites that will become active during winter conditions. This inspection should still occur on newly mobilized sites. Table 1 below identifies the ideal state and recommended controls for site hazards. A sample Hazard Assessment document can be found in Appendix 6.

Table 1: Guide for conducting pre-season hazard inspection.

Item	Ideal state
Roadways, walkways and parking areas	<p>Constructed with adequate drainage to avoid water accumulation. Existing roads, pathways and parking areas should be free of areas where water can accumulate and form ice slicks</p> <p>Marked so they are easily identifiable during heavy snowfall</p> <p>Clear delineation between walkways and roadways to minimize human machine interface. This can be accomplished with snow fence, handrail or rope railing.</p> <p>Established pedestrian crossings identified with reflective, high visibility signage. Blinking lights can be used to increase visibility.</p> <p>Delineated, using hard barricading, to protect buildings and other assets</p> <p>Snow storage areas, temporary or permanent, are not positioned so water must flow through roadways, pathways or parking areas to get to drainage systems</p> <p>Permanent or immovable objects are marked with reflective barricades or stakes to allow for visibility during low light hours.</p> <p>Road signage is reflective. Blinking lights placed on critical signage to increase visibility during heavy snowfall or darkness</p> <p>Hitch rail outlets to plug in engine block heaters are present and operational. Review manufacturer's specifications if block heaters are recommended for vehicles and equipment.</p>
Buried and above ground utility installations (Power lines, gas lines, etc.)	Marked with high visibility markings indicating location and depth

	<p>Guarded from vehicles and equipment taking special consideration for snow removal equipment. Ensure guarding will be appropriate for equipment used to remove snow.</p> <p>Insulated if carrying a product that can freeze during the coldest winter conditions</p>
<p>Lighting, heating and temporary power</p>	<p>Temporary light plants or permanent light standards placed in work areas, bus staging areas and around trailers that will be accessed during hours of low daylight</p> <p>Gas powered lighting, heaters and generators are placed to allow for safe refueling without spills</p> <p>Gas Powered lighting, heaters and generators are placed so the exhaust will not enter buildings, hoardings or other enclosed spaces</p> <p>Equipment is grounded according to manufacturers and site specifications prior to ground freezing. As ground freezes, grounding rods will be more difficult to install.</p> <p>All equipment maintained and used according to manufacturer's specifications</p> <p>Fire extinguishers placed within 25 ft. of all ignition sources. Extinguishers stored off the ground in a wooden box or on a stand to prevent freezing to the ground.</p>
<p>Material Storage Laydowns</p>	<p>Materials are raised on dunnage to prevent materials from freezing into the ground enabling safe lifting</p> <p>Materials are marked with high visibility stakes or barricaded for easy recognition after heavy snowfall. Ensure stakes or barricades are high enough that they will not be buried by winter snowfall</p>

	<p>Materials are positioned away from roadways, walkways and parking areas to avoid contact with vehicles and equipment</p> <p>Areas where new materials will be stored are designated and allow for snow removal</p> <p>Fluids that are susceptible to freeze and materials that could be damaged by cold temperatures are stored in heated buildings or hoardings. Special precautions for flammable products should be made to ensure interior storage area temperatures don't exceed the flash point of the product.</p>
Buildings exteriors	<p>Roofs that need to be accessed for snow removal have a fall protection system in place prior to winter weather conditions arriving. Travel restraint systems should be considered before fall arrest systems.</p> <p>Downspouts are positioned so water from snow melt will not create a slip hazard in high traffic areas during freeze/ thaw cycles</p> <p>Controls in place to prevent overhead ice and snow hazards from developing over building access/egress routes.</p>
Work areas	<p>Where snow drifts can occur, such as areas that are not protected from the wind, snow fence is installed. Snow fence will be more difficult to install once ground is frozen, installation prior to first freeze is recommended.</p> <p>Grit or sand boxes placed to enable easy re-stocking as well as in centralized locations for easy access which will encourage use.</p> <p>Grit boxes are equipped with shovels and ice picks</p> <p>Permanent or immovable objects are</p>

	<p>marked with reflective barricades or stakes to allow for visibility during low light hours. Markings are high enough that they will not become snow covered during heavy snowfall</p> <p>Cords and cables are raised off the ground on stands or buried, if possible. If not possible, cords and cables should be out of walkways and marked so they can be identified after snow fall</p> <p>All tools and materials are stored in designated storage locations</p> <p>Waste and debris removed from work and laydown areas are disposed of according to the site's waste segregation requirements</p>
<p>Water bodies (tailings ponds, ditches, natural ponds or sloughs)</p>	<p>Perimeter is hard barricaded with high visibility reflective markings that will stop vehicles, equipment and people from accessing the water's edge</p> <p>Signage is placed to indicate the hazards of the water body in the area and the precautions that need to be taken</p>
<p>Environmental</p>	<p>Secondary containment placed under all stationary equipment and mobile equipment not in use</p> <p>Spill kits on all mobile and stationary equipment</p> <p>No soil staining on any ground. Any stains or spills should be cleaned prior to being covered by snow</p> <p>Doors, windows and openings to interior areas such as buildings, sea cans, and hoardings, are sealed to prevent animals from entering</p>

When preparing the pre-season hazard assessment, pictures can be added to the assessment. Once snow falls, the pictures can assist in locating materials and structures.

On active sites in which the work areas are continually changing, the pre-season hazard assessment may need to be continuous until it is replaced by the in-season surveillance process. This will occur after first snow.

### **5.3.8 Holiday Shut down and Return to Site**

Some operations completely shut down over the holiday season while others stop all production work and keep a skeleton crew to perform preservation and snow clearing activities. A written plan for any holiday shut downs should be developed and should include:

- Duration of the shut down including dates
- Roles that will need to be filled during the shut down and responsible parties
- Equipment and supplies required for the duration of the shut down
- Pre-shut down activities

Creating a shutdown checklist will ensure that no items are missed (see Appendix 7). A pre-shut down meeting should be held with responsible parties and management representatives to establish the expectations and requirements during the shut down. Keep in mind; heating equipment required for preservation will require monitoring 24 hours a day, 7 days a week. If deliveries wont be needed during the shut down, it is also important to notify vendors and suppliers of shut down dates.

When preparing the shut down plan, the following activities will allow for a smooth shut down and re-opening:

- Schedule a general site clean up to prevent the creation of hidden hazards during snowfall
- Trailer and wash car preparation, including:
  - All appliances cleaned and unplugged
  - Food stored indoors, raised off the floor, in a clean, dry location to prevent wildlife attraction
  - Water coolers drained
  - Piping systems drained or treated with an anti-freeze product that is approved by site to prevent freezing.
  - Furnaces cleaned and serviced. Any furnaces, heaters or other ignition sources left operational during the shut down must be monitored for fire
  - Fuel and propane stocks are sufficient to supply all required equipment for the duration of the shutdown as deliveries may not be available over the holiday season.
- Vehicle preparation including:
  - Parking available with plug-ins to prevent damage. All vehicles that will not be operational for an extended period of time should be equipped with a block heater that is plugged in. The need for this will be dependent on temperature
  - Cabs cleaned out
  - Coolant and window washer fluid used is rated for the coldest possible temperatures for the region



- Pictures of material laydowns to assist in finding materials if heavy snowfall occurs over the shutdown as heavy snow fall is common over the holiday season.

The level of shut down will determine to what extent the above activities must be completed.

Before work can commence on site after a holiday shut-down, some critical activities may need to take place to ensure worker safety. These may include.

- Snow removal
- Re-instating power, heat and other utilities in trailers and wash cars
- Stocking up water, fuel and other supplies

Arrange for restocking of resources that will be needed for start up prior to the shut-down as procurement may not be possible over the holidays.

If pre-season site preparations are thorough, risks from winter hazards can be minimized and in-season operations will run as smoothly as possible.

## **5.4 Emergency Preparedness**

Emergency response plans should include potential impacts from winter conditions. Emergency communications, response times, evacuation procedures, and the ability to shelter in place or muster may be affected by winter conditions. All possible emergency types that have been identified in the emergency response plan need to be considered. During pre-season planning, any changes to emergency response plans can be made to include winter impacts.

### **5.4.1 Emergency Response**

On site and external emergency response times may be delayed due to road conditions. On site emergency response teams may need to be repositioned closer to work locations to minimize the impact of potential delays. More emergency response teams may be required to allow for positioning closer to work locations. Severe winter conditions may limit site access which could delay or inhibit external emergency response via roadways. Air transportation may also be inhibited during severe weather conditions. Alternate arrangements should be made in advance in the event emergency response can not access the site.

Emergency routes must be identified and be top priority for snow removal. Responsibility for snow removal of these routes should be clearly defined. A secondary contractor is important to also assign to remove snow from emergency response routes in the event the primary contractor can not complete the task.

### **5.4.2 Evacuation, Shelter-in-place and Muster**

In the event that evacuation is required during winter conditions, it is important to plan how the evacuation will be completed during the most extreme weather conditions the region may experience. When severe weather conditions will prevent an evacuation, arrangements need to be made to ensure the safety of all workers while they are stranded at the work location. Removing workers from the work location prior to conditions arriving that will prevent safe evacuation may be the best way to handle this situation. If shelter-in-place methods are to be used to protect workers, shelter-in-place

locations must have a heat source. During cold temperatures, interior locations that are not heated can present a risk of hypothermia to workers.

Adjustments to muster locations may be needed in preparation for winter conditions. If workers will be required to stay in the muster location for an extended period of time, the muster location should be indoors and have a heat source. If muster locations will only be used for a head count and workers will quickly be removed from the muster point to an alternate location, these can remain outdoors. Access and egress to muster locations should be high priority for snow removal activities.

### **5.4.3 Severe Weather Warnings / Alert System**

Some organizations may use a severe weather warning system to inform workers of current conditions and precautions as well as shutdowns and closures. It is important to determine if a weather warning and alert system is required for your organization.

Two types of communication systems may be used depending on the needs of the organization; to address workers at work or workers who are travelling to work. During work hours, communication systems such as radio all-calls, PA system announcements, phone calls or emails may be effective to notify employees. Notifications should provide specific direction of actions workers are to take during the severe weather conditions.

Workers who are not at work at the time of severe weather conditions may need to be notified of shut downs and closures. Communication of this information can be completed by telephone or email. For workers who are transported to work by the employer, notifications can be conducted through the transport service provider.

All employees should be provided with protocols for severe weather conditions during initial orientation. Information should also be posted in offices and lunchrooms as a reference.

Maximum acceptable working limits should be developed to determine when warnings and alerts need to be provided to the workforce. Once the maximum acceptable working limits are reached, all non-emergency work must stop. Conditions over these limits present increased risk of cold injury to workers. This may include, but is not limited to, temperature, precipitation, wind speed, local visibility, road conditions and ambient illumination. Two sets of limits may be established: the limit at which precautionary alerts are provided and the limit that work will stop. Appendix 4 and 5 can be used to help develop maximum acceptable working limits. A thermometer should be available on site to help monitor current conditions.

Development of severe weather protocols will help to limit worker exposure during severe weather conditions.

## **5.5 Vehicle and Equipment Maintenance and Operation**

Vehicle and equipment maintenance and operation is also impacted by winter conditions. Driving and equipment operation policies, practices and procedures must include precautions for winter conditions. Vehicles and equipment require winterization to prevent damage and allow for optimal operation during cold conditions. Ensuring that your vehicles and equipment are ready for the winter months is imperative in preventing injury to people and damage to equipment.

### 5.5.1 Winter Driving and Equipment Operation Policies, Practices and Procedures

To help prevent incidents caused or impacted by winter conditions involving driving and equipment operation, policies, practices and procedures should be updated to include winter driving and operating best practices. Policies, practices and procedures to consider for review are:

- Driving and light duty vehicle operation
- Equipment maintenance and set up
- Pre-use/ pre-trip inspections

Road maintenance and snow removal is the best way to mitigate the risks associated with winter driving. However, conditions can change quickly and it may not be possible to keep all roads maintained and clear of snow and ice to prevent incident or injury. Driving practices must adapt to road conditions. Adding desired winter driving practices to relevant policies, practices and procedures and reviewing these with the work force will help to mitigate the risk of incident. Desired winter driving practices are:

- Allowing vehicles adequate time to warm up prior to operation
- Ensuring all windows and mirrors are clean and free of debris for optimal visibility
- Using handles or steering wheel to maintain three point contact during accessing and egressing vehicles and equipment
- Decreasing speed of travel on icy or snow covered roads
- Increase stopping and following distances by approximately 3 times. Increase further for heavier vehicles as they take more time to stop.
- Checking weather and road conditions prior to starting journey. Current conditions can be found at [www.weathernetwork.com](http://www.weathernetwork.com) and [www.amaroadreports.ca](http://www.amaroadreports.ca)
- Taking only necessary journeys. Do not travel in severe conditions except during emergency situations
- Allowing more time to complete your journey
- Fueling vehicles prior to the trip
- Planning quantity of fuel required for the trip and location of fuel stops if required
- Ensuring the vehicle is ready for operation by completing winter pre-trip checklist
- Avoiding use of cruise control in winter conditions
- Driving defensively and being aware of other vehicles on the road
- Applying solid pressure and continuing to steer while braking

These practices can be added to any company or site specific driving requirements.

Equipment winterization and operating procedures must be developed in accordance with the manufacturer's specifications. Each piece of equipment or vehicle is only required to be winterized once a year. Although this may be completed for several pieces of equipment and vehicles, it should be treated as any other infrequent task. Hazard assessments must be completed and reviewed by workers prior to the job tasks being completed.

Other equipment and vehicle maintenance and set up procedures that may need to be developed or updated include:

- Towing
  - Vehicles and equipment can become stuck in deep snow or mud
- Boosting equipment

- Cold weather may result in equipment needing a boost to start
- Fueling
  - More equipment to fuel because of more generators, light plants and heaters
- Heater set up and maintenance
- Light plant maintenance and set up

Preparation and review of practices and procedures should take place before they are needed during the winter season. This should be conducted in late September to ensure workers have adequate time to review and ask questions and documents can be revised if needed.

Pre-use or pre-trip inspections are common practice for equipment and vehicles. Often, a checklist is used to ensure a thorough inspection is completed. Winter season items can be added to the checklist to ensure vehicles and equipment will be prepared for winter conditions. Additions may include but aren't limited to:

- Heater/defrost function is operational
- Tire tread is appropriate for road conditions
- Tire pressure meets manufacturer's specifications
- An ice scraper, snow brush and shovel are in good condition and in the vehicle
- Lights are operational (Head, brake, signal and hazard lights)
- Emergency Supplies are available
- Fluid levels are full
- Snow is cleared from the entire vehicle exterior

Ensure equipment and vehicle pre-use or pre-trip inspection checklists are completed on a daily basis prior to use.

### **5.5.2 Vehicle and Equipment Winterization and Inspections**

In mid-October, schedule all vehicles for a pre-season preventative maintenance inspection and servicing that meets or exceeds manufacturer's specifications. A winterization checklist should be completed by a competent worker for each vehicle and piece of equipment. In addition to regular preventative maintenance, the winterization checklist should ensure:

- All fluids, such as windshield washer, engine oil, antifreeze, and other lubricants, are winter grade and rated for the coldest operating temperatures. Fluids that are not winter grade should be replaced. Stocks of winter grade lubricants should be ordered in September.
- Windshield wipers are operational. Blades are in good condition and strong enough to clear heavy snow accumulation. If older than six months consider replacement
- Each vehicle is equipped with an ice scraper, snow brush and a shovel. Ordering these supplies should take place in September to ensure stocks are available when needed
- Interior heaters provide sufficient heat and defrost functions are operational
- Engine block heaters are installed and operational

- Each vehicle that is used for driving off site is equipped with emergency supplies such as a first aid kit, fire extinguisher and road triangles. In addition to supplies that may be in the kit year round, winter seasons additions should include:
  - Emergency blanket
  - Winter gloves
  - Booster cables
  - Flashlight with batteries
  - Emergency heat source, such as a candle with matches
  - Cell phone or other means of communication
- Glycol and Hydraulic lines should be inspected for breaks, cracks, or leaks.
- Tires are good quality and appropriate for the road conditions the vehicle or equipment will operate on. It is important that each vehicle be equipped with the correct size and type of tire that is recommended by manufacturer's specifications. Many types and ratings of tires are available, see Appendix 8.

## **5.6 Environmental Considerations**

Winter conditions and activities can negatively impact the environment. Impacts can affect water, soil, air and wildlife. Planning for these environmental impacts during the pre-season is the best way to prevent an environmental incident.

### **5.6.1 Water**

Two concerns need to be considered to ensure the care of water. The first is erosion and sedimentation control and the second is spills to water. Dewatering of ground water and snow melt from work locations may be required. During dewatering large amount of sedimentation can be deposited when the water is moved. It is important to consider the site's water management requirements prior to the winter season. The water management plan may include important specifications such as locations water can be dewatered to, dewatering methods, water test requirements and any equipment that may need to be ordered prior to the winter season. Materials and equipment needs may include:

- Hoses and pumps
- Silt fencing materials
- Water diffusers
- Water testing equipment

Site requirements may have limitations on the amount of sedimentation, conductivity or dissolved substances that can be present in water that may enter ponds and streams. Water testing may be required to ensure the water is not over any limits before being released.

Site and environmental requirements must be considered when selecting de-icing products, locations of snow dumps and flow of melt water. Salt used as ice melt is commonly prohibited as high concentrations of salt can change the pH and conductivity of ground water. Sedimentation control may be needed for melt from snow dumps. Planning for care of water during the pre-season can prevent harmful impacts to water systems and save expensive in-season and post-season clean-up activities.

To prevent spills to water it is important to control activities that could lead to spills around water bodies. These activities could include fueling, fuel storage, and waste storage. Avoid any fueling or storage of fuel and hazardous materials close enough to water that a spill would enter the water body. Fueling that must occur near water should only be done if spill containment is used to collect any drops or spills from over fueling. If storage must be placed near water, berming should be placed to contain any spills. Consultation of local and federal environmental legislation will ensure compliance.

During spring run off, larger volumes of water may be located in areas that do not typically have water. Spill prevent and response must take into account water accumulation and movement during spring run off.

### **5.6.2 Soil**

Care of soil focuses on spills. Spills can occur during fueling, handling chemicals and hazardous materials or due to mechanical failure of equipment. During the pre-season hazard assessment, any spills can be identified and cleaned prior to being covered with snow. Monitoring for staining can be added to the in-season inspection checklist. Spill trays should be used when refueling equipment as any drips or spills can be masked by the snow. It is important to ensure enough spill kits and secondary containment will be available for all equipment on site. When ordering heaters, lighting, generators and snow removal equipment, ensure secondary containment is ordered for each piece of equipment. The secondary containment must hold 10% more than the maximum volume of fluid the equipment can hold.

Bulk fuel and lubricant storage should be in compliance with WHMIS, regulatory and site environmental requirements. Storage areas must be continuously monitored for spills and staining.

### **5.6.3 Air**

Exhaust emissions during the winter season increase due to combustion heaters, lighting, generators and idling vehicles. Site air quality requirements should be consulted during the pre-season planning process. A vehicle idling policy may be required. Typically, idling should be avoided at temperatures above -20°C.

### **5.6.4 Wildlife**

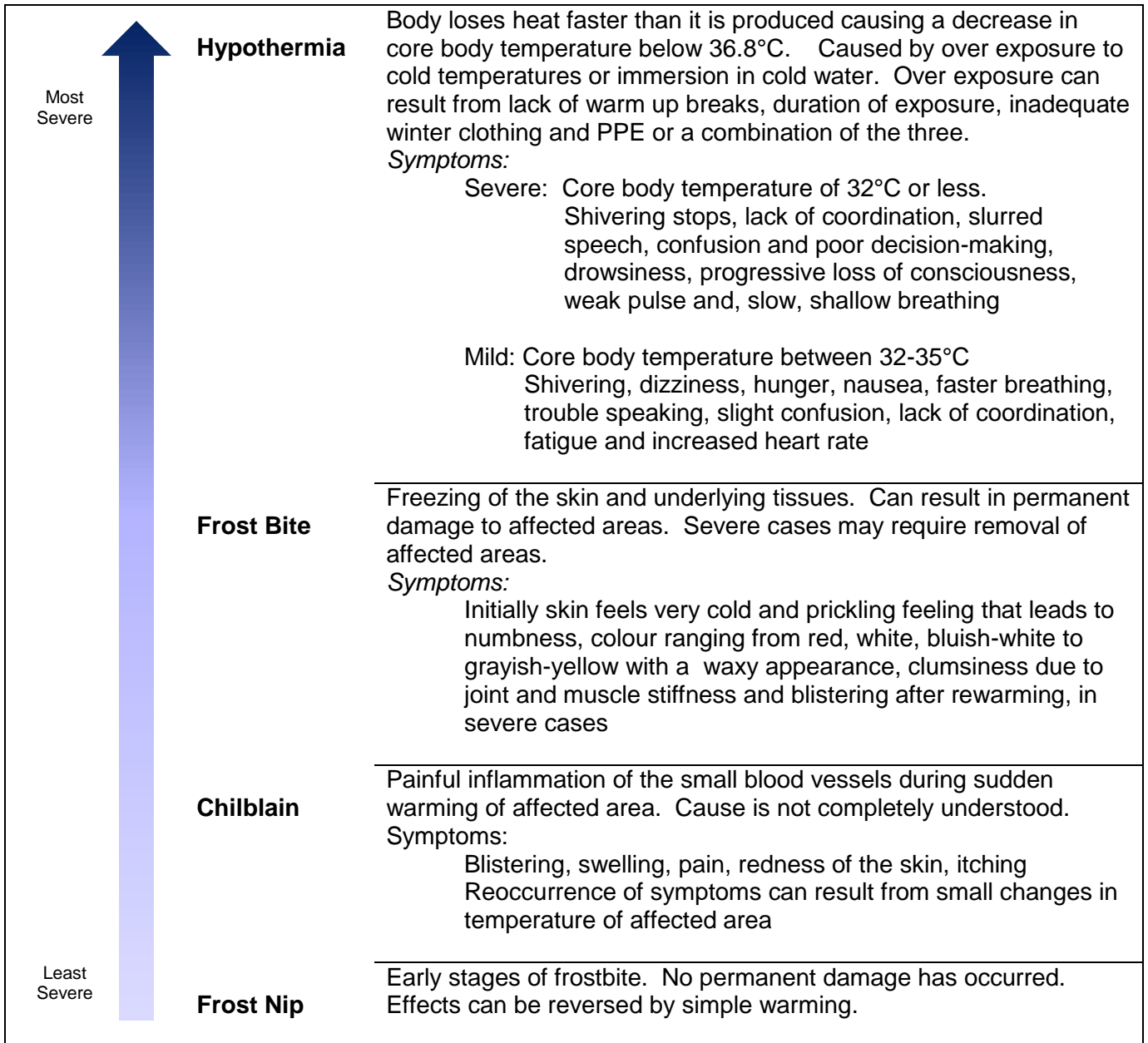
Wildlife will be preparing for one of three activities: migration, hibernation or preparing for the cold season. All of these activities require animals to search out large amounts of food. All food and food waste must be stored to not attract wildlife in wildlife proof containment. During preparation for the winter season, it is important to ensure all interior areas are sealed tightly to avoid animals from seeking shelter inside when the temperatures start to drop.

## **5.7 Winter PPE Selection**

When completing the hazard assessments for winter work, it is important to use the control hierarchy to mitigate winter hazards and worker cold exposures. As for any PPE, winter PPE is the last line of defense in controlling worker's exposure to the cold. If used correctly, winter PPE can be very effective at mitigating cold exposure when elimination, engineering and administrative controls do not completely mitigate the risk of cold injury.

To assist in selecting the best winter PPE, it is important to understand the consequences of cold exposure. Understanding cold injuries will help to ensure PPE

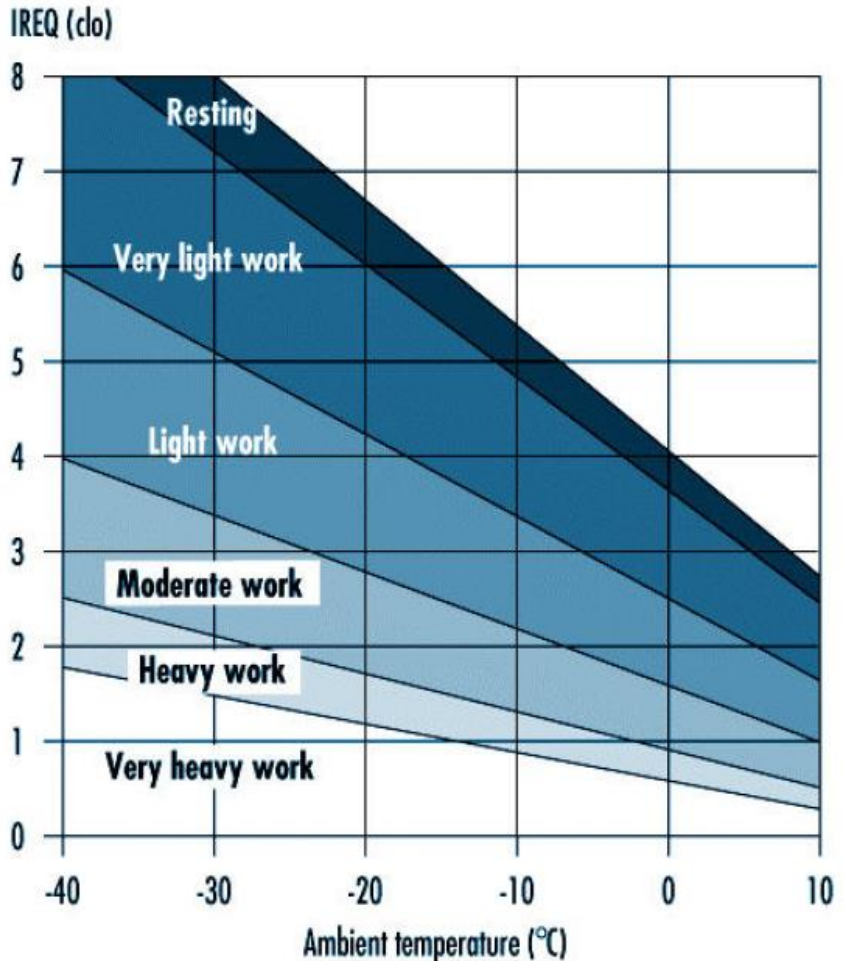
selected will prevent the most severe outcome. Cold exposure can vary in severity as shown in the figure below.



Selecting the correct PPE will help prevent the occurrence of the above cold related injuries.

When selecting winter PPE, environmental factors such as ambient temperature, precipitation and wind, activity level of the work and other hazards of the task the PPE will also have to protect against must be considered. The figure below shows the relation between temperature, activity level and required insulation. Required insulation, or IREQ, is measured in clo. The insulating value of clothes selected should be based on ambient temperature of the work environment and the anticipated metabolic rate of work activity.

<b>Activity Levels:</b>	
<b>Resting:</b>	No activity
<b>Very Light:</b>	Sitting at ease, completing light hand, arm or leg work such as typing or driving, standing in one position, walking at ease
<b>Light:</b>	Sitting or standing with moderate hand and arm work. Casual walking, light infrequent lifting
<b>Moderate:</b>	Repetitive arm or leg work, moderate pushing and pulling, quick walking, frequent light lifting
<b>Heavy:</b>	Heavy arm and leg work, fast walking or jogging, heavy pushing and pulling, frequent heavy lifting
<b>Very Heavy:</b>	Running, maximum paced work, continuous climbing, and quick heavy lifting



**For example:** A worker is completing light wheelbarrow work, at an ambient temperature of -20°C. Reading off the chart where the moderate work region crosses with the -20°C mark, an IREQ value of about 2-3 clo. is obtained.

Required insulation levels may vary depending on the individual worker. Required insulation values will provide a guideline when selecting winter clothing to prevent core body temperature from decreasing. Clothing with higher insulation values may be required to prevent other cold injuries such as frostbite or protect from wind or other environmental conditions.

Many insulated garment manufacturers provide guidance for recommended temperature and level of work activity. The table in Appendix 9 shows the general IREQ (clo) values for common winter garments. This table can be used for garments from manufacturers that do not provide guidelines for their product.

Work activity and temperature may vary throughout the day. Dressing in layers allows the worker to add or remove layers as needed. Adjustments to layers should be made prior to work rate or exposure changing to prevent sweating and cooling effects. Generally, three types of layers can be used to increase effectiveness of winter work wear. These are:



<b>Layer</b>	<b>Purpose</b>	<b>Examples</b>
<b>Inner</b>	<i>Absorb moisture and keep it away from the skin.</i>	<ul style="list-style-type: none"> <li>• Thermal underwear (top and pants)</li> <li>• Wool or thermal socks</li> <li>• Glove liners</li> </ul>
<b>Insulating</b>	<i>Helps keep a layer of warm air trapped around the body.</i>	<ul style="list-style-type: none"> <li>• Fleece mid-layer (top and pants)</li> <li>• Boot liners</li> </ul>
<b>Outer</b>	<i>Keeps dust, dirt, wind, and moisture away from the previous layer. Easily removed to prevent the buildup of body heat.</i>	<ul style="list-style-type: none"> <li>• Balaclava / face mask</li> <li>• Arctic-type parka</li> <li>• Outer wind-block pants</li> <li>• Insulated gloves or mittens</li> <li>• Insulated work boots</li> </ul>

Winter PPE can be bulky and limit mobility. Over protection may result in unnecessary hazards to workers. Once the level of insulation is determined, it is important to select PPE based on the work to be completed. PPE must protect against the cold and the hazards of the job task but still allow enough mobility and dexterity to complete the task.

Other than inadequate protection from cold exposure, selecting PPE that is not correct for the task or the conditions can create the following hazards:

- Blocked vision or loss of peripheral vision
- Layering around ears preventing hearing
- Eyewear fogging
- Snow glare
- Decreased dexterity
- Cuts, scraps and abrasions to hands
- Lack of mobility
- Inadequate traction for ground conditions causing slips, trips and falls.

Selecting PPE that best suits the task and the conditions will ensure the risk of injury is mitigated to a level as low as possible but still allows the work to be completed. Each piece of PPE has specific characteristics to consider. These are provided in the following sections.

### **5.7.1 Base Layers**

Base layers paired with outer layers are the best method to protect the skin from cold and moisture. Base layers include inner and insulating layers. The purpose of these layers is to draw moisture away from the body and provide the insulation required for the cold exposure of the work environment.

Often the work environment requires outer layers to meet certain specifications. Two common requirements are chemically resistant or fire retardant (FR). Base layers also need to be compatible with the work environment. Incompatibility of base layers with the work environment can increase the risk of injury to the worker. For FR requirements, base layers must be made of FR fabrics or natural fibers. Serious injury can result if the wearer has non-FR base layers under FR outer layers during a fire or flash over. The base layers can fuse with the wearer's skin resulting in serious burns and tissue damage.

Inner base layers should fit tight to the skin, be breathable, moisture wicking and comfortable. These include undergarments, long underwear and under shirts. Natural fibers such as cotton and wool will allow the greatest amount of breathability and moisture control. Some advanced technology synthetic fibers also exist that provide good breathability and moisture control but these may not be FR.

Insulating base layers will provide the majority of insulation required for the specific cold exposure. Using multiple layers to achieve the appropriate level of insulation will allow for adjustments to be made as conditions and activity levels change. Insulating base layers include hoodies or sweaters and pants. When selecting hoodies or sweaters consider site requirements as some site may not allow hoodies. Hoods limit peripheral vision and should never be worn while driving or working around equipment. If hoodies are permitted, consider using hoods that can detach using Velcro or snaps and removing strings to avoid the wearer from being caught and pulled into moving parts.

Keep inner and insulating base layers clean of dirt and dry to maximize protective capabilities.

### **5.7.2 Outerwear**

Outerwear may provide some insulation but its main purpose is to provide protection from wind, moisture and non-winter hazards that are present due to the job task or work environment. Other hazards may include fire/explosion, sharp or abrasive materials, chemicals, or steam.

Outerwear that is the correct fit will help prevent loss of body heat. This is best accomplished with outerwear that has fitted sleeves and pant legs. Avoid short jackets that may rise up during work exposing the torso. Outerwear should be loose enough that it is comfortable to work in but not so loose that cold drafts can access the body allowing for heat loss.

Outerwear selection should consider:

- Moisture repellency: waterproof or water resistant
- Wind repellency
- Reflectivity and color requirements
- Other environmental hazards such as chemical exposure or fire
- Unmitigated risks of work task hazards

Selecting the right combination of base and outer layers for the work and environment will help mitigate the risk of heat loss preventing hypothermia.

### **5.7.3 Head and Face Protection**

During cold conditions any skin that is uncovered is susceptible to heat loss and cold exposure. Heat loss will occur from your head proportionate to the percentage of body surface area your head, face and neck comprise. Also frostbite of the nose, ears and cheeks is very common. To prevent frostbite and heat loss, the head, face and neck can be protected using balaclavas, hard hat liners, neck warmers and toques.

Balaclavas, hard hat liners, neck warmers and toques must:

- Fit tightly and not bunch
- Not inhibit the protective capabilities of the hardhat
- Provide adequate thermal protection for the work environment

- Not limit vision or mobility
- Overlap to avoid gaps in insulation
- Be constructed out of FR material if required by the work environment

Hoodies and toques worn under hardhats may affect the fit of the hard hat. Hard hat liners and neck warmers should be considered first.

#### 5.7.4 Eye Protection

When selecting protective eyewear, winter conditions may also present risk of injury and should be considered as well as job task hazards. Cold injuries can occur to the eyes during extreme cold conditions and high winds. Eyewear should be fitted to prevent cold air from contacting the eye. Styles of goggles are available for extreme weather conditions that provide superior insulation

Moisture from breathing and perspiration can cause eyewear to fog. To prevent glasses from fogging use those that have anti-fog qualities. Anti-fog lenses may have an anti-fog coating on the inner lens, have a double pane lens design or have venting. Effectiveness of each style will be dependent on the wearer’s facial features. Several styles may need to be available to accommodate all workers. Eyewear can also be treated with anti-fog sprays or wipes.

Illumination levels of the work area will help to determine lens shading or colour required. The table below describes the different lens colours that should be used:

Dark tint	Shouldn't be used during low light levels or indoors
50/50	Convenient for workers frequently changing from interior to exterior areas
Clear	Used during low light levels
Colored- typically yellow	Used during all light levels Best option to prevent snow glare

Protective eyewear should improve worker’s visibility and be comfortable to wear while protecting against the hazards presented by the work environment. Any eyewear selected must also meet any site requirements and CSA Z94.3.

#### 5.7.5 Gloves

Gloves must be made of material that is suitable for the highest severity job hazard and cold exposure while allowing for enough dexterity to perform the task. Two options may be used to protect against job hazards and the cold: insulated gloves or non-insulated gloves paired with liners. Layering increases warmth of fingers and improves dexterity. Liners used for layering must be compatible with the protection requirement of the glove. For example, if gloves need to be FR, liners should be made of natural fibers such as cotton. The figure below depicts how gloves and liners can be paired for varying levels of insulation.



Mittens provide the highest level of insulation but may not provide enough dexterity to complete the work. If mittens have been determined to be required to provide enough insulation, gloves can be used in these conditions as long as warm up breaks are permitted to allow the workers hands to fully warm up before returning to the cold. To minimize exposed skin, use a gauntlet style glove or mitten that overlaps with the sleeve of the jacket.

Wet gloves may lose their insulating properties. Water resistant gloves should be considered if gloves may become wet. If water resistant models aren't available, multiple pairs of gloves should be available to allow for change out.

Any gloves selected for use must meet site requirements.

### 5.7.6 Boots and Traction Aids

Winter footwear must provide enough insulation to prevent cold exposure injuries, enough traction for the surface they will be used on and protect against other hazards that may be present due the work task or environment. Common winter conditions that footwear must be able to protect against are:

- Wet conditions- Boots are made of waterproof or water resistant material such as rubber, polyurethane or leather. Soft rubber soles will offer the best slip resistance on slippery conditions. A 15 inch rise will allow for lower leg protection and prevent water from falling into the boot.
- Cold Conditions- Boots have thermal polyurethane sole that doesn't become brittle in cold temperatures. Insulating liners can be removed if it becomes wet.
- Snow and ice conditions- Boots have an aggressive tread and sole pattern for increased traction. Can be paired with a traction aid to improve traction.

Depending on the work environment, footwear may need to be suitable for all of the above conditions. Several styles and fits of boots are available. Ensure that all boots are CSA approved and meet all site requirements.

The best method to mitigate the risk of injury due to slips, trips and falls on icy surfaces is to clear snow and ice from the surface and apply grit. This method is not always

possible. For situations that the risk of slips, trips and falls on icy surfaces remains, traction aids can help mitigate the risk.

Various styles of traction aids are available each with varying characteristics suitable for different environments. When selecting the best traction aid for the worker to wear consider:

- Surface traction aid will be used on
- Boot styles and sizes traction aid will need to fit
- Tasks to be completed while wearing traction aids
- On/off frequency
- Hazards the traction aid may add to the work and possible controls

Traction aids may have various characteristics each with advantages and disadvantages. Appendix 10 explains the advantages and disadvantages of these characteristics. This table should be used to select the best traction aid for the job task and work environment.

## **5.8 Ordering and Stock Inventory**

Appendix 11 provides an inventory and ordering log of possible equipment, materials and PPE that may be needed prior to the winter season. This log can help in determining inventory onsite and stocks that need to be ordered.

### **5.8.1 Site Preparation**

A variety of equipment and material are available to control winter conditions. Each site will have different needs and different equipment will be the best fit. Using information from years prior will help in the selection of equipment and materials. On new sites, using information from other sites and contractors can help.

### **5.8.2 PPE**

Once the PPE that will best suit the work environment, job tasks and workers required to wear it has been selected, the items will need to be ordered in a variety of sizes. Various models with the same characteristics may also be required to ensure PPE fits all workers

If the site has existing stock, an inventory of current stock will help prevent over ordering. When determining stock requirements, determine what items will be supplied at the site, and what items the workers will supply themselves. Number of workers and replacement frequency will help to determine quantities required. Items such as gloves and eyewear may need to be replaced several times over the winter season whereas base layers, outerwear and boots should last the entire season.

Winter PPE stock should be ordered in September to ensure items are available when winter conditions set in.

In addition to PPE, some other personal items that can assist workers in mitigating the risks of winter hazards are heat packs and headlamps. The necessity of these items should be considered when conducting the job hazard assessment. If determined necessary, these items should be ordered at the same time as the PPE stock.

Appendix 11 provides an inventory and ordering log of possible equipment, materials and PPE that may be needed prior to the winter season. This log can help in determining inventory onsite and stocks that need to be ordered.

## **5.9 Winter preparedness Campaigns**

Preparing the site, winterizing vehicles and equipment and selecting and ordering winter PPE are important parts in mitigating the risk of incident or injury caused by winter conditions. Informing and training workers is the final part of pre-season preparations.

Pre-season winter preparedness campaigns should ensure workers have all the information they require to work safely during the winter season. A campaign planner can help to ensure a smooth roll out. A campaign planner can be found in Appendix 12. Campaign topics should include but are not limited to:

- Basic winter orientation for workers who may be experiencing winter conditions for the first time
- Slip, trip and fall hazards
- Cold Injuries
- Stretching and warm up routines
- Winter driving
- Vehicle and equipment maintenance and operation including idling and vehicle warm up policies
- Buddy system for monitoring for cold injuries
- PPE selection, use and maintenance
- Winter walking precautions including use of traction aids
- Review of Policies, JHA, JSA, and SWP that are relevant to winter work
- Ergonomics for task such as manual snow shoveling
- Cold and flu prevention

Winter preparedness campaigns can be conducted through numerous different delivery methods such as training sessions, safety meetings, tool box talks, flyers and posters. Information can be found from the following sources when developing materials:

- Working in Heat and Cold (AB OHS Guideline)
- Cold Weather Workers Safety Guide (Canadian Centre for Occupational Health & Safety)
- Musculoskeletal Prevention Guidance Sheet: Risk Factor Cold Temperature (WorkSafe BC)

Sample posters, bulletins and tool box talks can be found in Appendix 13. Preparation of campaign materials should begin in September.

## **6.0 In-Season Work Execution**

During the winter season the main goal is to execute the plan that was created during the pre-season. Thorough pre-season planning will make in-season work execution run smoothly.

Pre-season planning aims to prepare the site and workers for the winter season to prevent injury and incident. In-season monitoring and continual worker education and training will help to mitigating the risks associated with winter hazards.

## 6.1 Continual Monitoring

It can be difficult to create a fully comprehensive winter work plan. Continual monitoring will further help to ensure the plan has not missed anything and is being executed as intended.

Continual monitoring can be accomplished in various formats including inspections, audits and surveys. All parts of the plan that are being executed should be checked. Important items to monitor are:

- PPE effectiveness
- PPE use
- Road condition and maintenance
- Access/egress routes
- Buildings and overhead ice and snow hazards
- Weather conditions
- Slip, trip and fall hazards or potential problem areas
- Staining under stationary equipment
- Presence of wildlife attraction around lunchrooms or interior work locations

Checklists and inspection forms can be created to ensure nothing is missed. Topics can be combined in a variety of formats to best suit the site's needs. Sample forms can be found in Appendix 14.

The frequency of inspections and monitoring will depend on the site but should be completed after major changes in weather conditions, site configuration or when working in new or infrequently used areas. Some sites may determine that daily or weekly checks will be completed. Frequency of continual monitoring should be determined during pre-season planning.

## 6.2 Continual Training and Education

Any pre-season training and education topics should be continually provided to workers throughout the winter season. This will ensure workers have the information and training required to protect them from winter conditions while performing their work tasks. New workers to the site that missed pre-season training should be trained prior to commencing work.

Refreshers and reviews can be delivered through safety meetings, tool box talks or formal training sessions. Most formal training sessions will take place in the pre-season. The same materials that were used in the pre-season may still be appropriate or materials may need to be updated to make them relevant to the current conditions and in-season requirements.

Topics that should be reviewed during the in-season work execution include but aren't limited to:

- PPE use and maintenance
- Cold exposure and cold injuries
- Stretching and warm up breaks
- Buddy system
- Winter driving and vehicle maintenance
- Slip, trip and fall prevention

- Ergonomics for snow removal

### **6.3 Preparation for spring melt**

Near the end of the winter season it will be time to prepare for spring melt. Good site preparation during pre-season planning will ensure that preparations for spring melt are already in place. At the end of the winter season equipment and materials may need to be ordered that will be needed for spring melt such as pumps and hoses for dewatering.

Prior to spring melt, review the plan and ensure that planned water run-off areas are still appropriate. Also, determine if ditching systems will be able to handle the amount of water that may accumulate based on the amount of snow. Assume the worst case scenario and that all the snow will melt very quickly. If supplementary ditching or berming needs to be constructed this can be done before melt starts to prevent flooding. Remember to consider site environmental conditions when planning for water movement.

## ***7.0 Post-season De-winterization and Program Review***

Once the winter season is over, de-winterization and clean-up of work areas must commence. In addition to de-winterization, review of the winter works program should be conducted so improvements can be made for the upcoming seasons.

### **7.1 De-winterization**

Both the site and equipment will require de-winterization. As snow melts, debris and materials will begin to appear that was covered in snow. A general site clean up should be conducted in the post season. Before all areas are accessed for cleaning a thorough hazard assessment should be conducted. This is especially important if the area was not accessed regularly during the winter season. The ground below any equipment that remained stationary throughout the winter season should be checked for ground staining that was masked by the snow.

Equipment and vehicle de-winterization should occur when it is certain winter conditions are over. During spring melt, muddy road conditions can cause mud build up on the under side of vehicles and equipment. All equipment should be scheduled for cleaning and a preventative maintenance check to ensure no damage occurred that was hidden by the mud. Fluids can be swapped out for summer grade fluids during de-winterization.

Accumulations of road grit will begin to be apparent as snow dump locations melt. Recycling the grit is possible but the grit may need to be filtered to remove debris.

### **7.2 Program Review**

To assess the effectiveness of the winter works program, it is important to conduct a review during the post season. This will allow for continual improvement of the program and help to further mitigate risks from winter hazards for the upcoming seasons.

When conducting the review ensure to include:

- Worker feedback on PPE fit and effectiveness



- Corrective actions from any incidents where winter conditions were a contributing factor
- Lessons learned during the season that could enable safer work execution, higher production or few environmental impacts
- Trends from in-season hazard identification programs, audits and inspections
- New best practices, lessons learned or changes to legislation from other sites and contractors
- Impacts program execution had on people, production, environment and materials

Program review should include all parties that were involved in program execution including management, front line supervision, workers and safety. A post season review meeting can be held to gather information from all parties. Information collected should be used to update the program for the upcoming season.

## 8.0 Appendix

Below is a list of appendices and the sections each appendix is referenced in.

#	Title	Sections
1	Schedule for Existing Sites	4.0 Schedule of Events
2	Schedule for New Sites	4.0 Schedule of Events
3	Winter Work Kick Off Meeting Action Plan	5.1 Winter Safety Kick-off Meeting
4	Wind Chill Chart	5.2 Hazard Assessment Tools 5.4.3 Severe Weather Warning/ Alert Systems
5	Cold-Exposure Guidelines for Outside Workers	5.2 Hazard Assessment Tools 5.4.3 Severe Weather Warning/ Alert Systems
6	Site Pre-season Hazard assessment checklist	5.3.7 Pre-Season hazard assessment
7	Holiday Shut down Checklist	5.3.8 Holiday Shutdown and Return to Site
8	Winter Season Tires	5.5.2 Vehicle and Equipment Winterization and Inspections
9	Insulating Value of Clothes	5.7 Winter PPE Selection
10	Traction Aid Characteristics	5.7.6 Boots and Traction Aids
11	Inventory and Ordering Log	5.8 Ordering and Stock Inventory
12	Campaign Planner	5.9 Winter Preparedness Campaign
13	Sample Winter Campaign Materials	5.9 Winter Preparedness Campaign
14	In-Season Checklist	6.1 Continual Monitoring







## 8.3 Appendix 3: Winter Work Kick-off Meeting Action Plan

### Winter Work Kick-Off Meeting

Company: \_\_\_\_\_

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

Location/Facility: \_\_\_\_\_

The purpose of the kick off meeting is for all involved parties to meet to discuss pre-winter activities and site requirements in preparation for winter conditions. The meeting will accomplish two goals:

1. Review the Winter Work Plan and Schedule
2. Assign personnel/sub-committee to complete each activity

<b>Pre-Season Activity</b>	<b>Description of Activity/Task</b>	<b>Person Responsible for Completing Activity</b>	<b>Date activity is to be completed</b>
Winter PPE	Determine requirements and inventory needs. Start ordering process		
Winter Safety Readiness Review	Set meeting with contractors and sub-contractors to complete the pre-season hazard assessment. Review Winter Works Plans with contractors.		
Winter Safety Campaign Development	Ensure all campaign materials and supporting documentation is ready for the campaign roll out.		
Site Hazard Assessments	Complete the pre-season hazard assessment/checklist		
Site Preparation	Prepare the site based on the findings from the Site Hazard Assessment. Ensure controls are in place.		

**Additional comments/ Actions:**

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## 8.4 Appendix 4: Wind Chill Chart

### Environment Canada Wind Chill Chart

Actual Air Temperature  $T_{air}$  (°C)

Wind Speed $V_{10\text{ m}}$ (km/h)	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70
30	0	-6	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76
55	-2	-8	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

where

$T_{air}$  = Actual Air Temperature in °C

$V_{10\text{ m}}$  = Wind Speed at 10 metres in km/h (as reported in weather observations)

Notes:

1. For a given combination of temperature and wind speed, the wind chill index corresponds roughly to the temperature that one would feel in a very light wind. For example, a temperature of -25°C and a wind speed of 20 km/h give a wind chill index of -37. This means that, with a wind of 20 km/h and a temperature of -25°C, one would feel as if it were -37°C in a very light wind.
2. Wind chill does *not* affect objects and does *not* lower the actual temperature. It only describe how a human being would feel in the wind at the ambient temperature.
3. The wind chill index does *not* take into account the effect of sunshine. Bright sunshine may reduce the effect of wind chill (make it feel warmer) by 6 to 10 units.

Frostbite Guide
Low risk of frostbite for most people
Increasing risk of frostbite for most people within 30 minutes of exposure
High risk for most people in 5 to 10 minutes of exposure
High risk for most people in 2 to 5 minutes of exposure
High risk for most people in 2 minutes of exposure or less

## 8.5 Appendix 5: Cold Exposure Guidelines for Outside Workers

### Work/warm-up schedule for a 4-hour shift

Air temperature – Sunny sky		No noticeable wind		8 km/h wind		16 km/h wind		25 km/h wind		30 km/h wind	
°C (approx.)	°F (approx.)	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks
-26° to -28°	-15° to -19°	(Norm. breaks)	1	(Norm. breaks)	1	75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm. breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease		Non-emergency work should cease			
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease		Non-emergency work should cease							

#### NOTES:

- Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of 10 minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For light-to-moderate work (limited physical movement), apply the schedule one step lower in the table. For example, at -35° C (-30° F) with no noticeable wind (Step 4), a worker in a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
- The following is suggested as a guide for estimating wind velocity if accurate information is not available:  
8 km/h – light flag moves; 16 km/h – light flag fully extended; 25 km/h – raises newspaper sheet; 30 km/h – blowing and drifting snow.
- If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factor given above would be: (1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/m<sup>2</sup>; (2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges because windy conditions rarely prevail at extremely low temperatures.
- TLVs apply only to workers in dry clothing.

Refer to the "Cold Stress" section of the current *Threshold Limit Values and Biological Exposure Indices* publication for further information.

## 8.6 Appendix 6: Site Pre-Season Hazard Assessment Checklist

The following two templates can be adapted to fit the needs of the specific site. Use the table in section 5.3.7 to update the templates as necessary to suit the site requirements for a thorough Pre-Season Hazard Assessment checklist.

Item No.	Description	Responsible Party	Required Date	Date Completed	Comments
<b>A</b>	<b>Safety</b>				
1	Review SWP for Cold Weather Work at a safety meeting				
2	Prepare Tool Box Topics on Winter Precautions and Present to Workers				
3	Slips & Trips campaign				
<b>B</b>	<b>Eliminate Hazards</b>				
1	Inspect and Remove / Elevate Temporary Electrical Cables				
2	House keeping- all items / trip hazards cleaned up.				
3	Boot cleaners at all doors				

4	Lighting assessment ensuring high mast lighting and light plants are placed and all in good operating condition				
5	Determine snow fence requirements				
6	Provide Clear Access Ways for Equipment to Work				
8	Ensure all low laying objects are highlighted in the event of heavy snow fall (pylons)				
10	Cone lay out around material laydowns				
<b>c</b>	<b>Material Storage</b>				
1	Clear Out Lay Down Areas Prior to Winter removing unnecessary materials				
2	Prepare & Store Material in Lay Down Areas for Winter Conditions. Raise materials on dunnage				
3	Barricade and indicate material storage to identify trip hazards				
4	Provide Heated Storage for Temperature Sensitive Materials. No Flammable Materials to be Stored in Trailers.				

<b>D</b>	<b>Snow Removal/Sanding</b>				
1	Prepare snow dump and grit and deicer storage areas on site				
2	Supply grit for spreading on Slippery Areas in work areas. Grit is stored in boxes				
6	Service / order snow blowers				
7	Shovels / brooms ordered and accessible				
<b>E</b>	<b>Heat &amp; Hoard</b>				
1	Hoardings are built so they can withstand weight from snow accumulations				
2	Identify areas where heaters will be required and what type of heater will be suitable				
<b>G</b>	<b>Equipment / Fuel</b>				
1	All equipment is equipped with a spill tray and spill kit				

2	Winterize all equipment				
3	Fuel and lubricant storage is away from water sources and stored in accordance with WHMIS and TDG				
4	Order Light Plants / Portable lighting				
<b>H</b>	<b>Miscellaneous</b>				
1	Winterize fire hydrants				
2	Check power at hitching stations for block heaters				
3	Tool cribs have a supply of winter PPE				
8	Winterize buildings and trailers				

PROJECT / SITE WINTER READINESS TOOL  
PART 2 – WINTER WORK

Project:		Date:
Location / Facility:		
Inspection Team Lead(s)	(1)	(2)
Company/Contractor	(1)	(2)

Item	Comment / Status	Due Date	Done
<b>People:</b>			
Implement winter work orientation and awareness programs			
Implement the workplace safety Personal Accountability policy			
Proper PPE made available when needed to suit weather conditions			
Mandatory winter PPE implemented and enforced (e.g.: boot tread audits, non-skid footwear accessories, proper helmet liners, appropriate gloves, etc)			
Work plans developed/adjusted to accommodate reduced productivity, and subsequent adoption of short cuts			
Project/site leadership aware of potential of short cuts to maintain productivity in the face of bad weather			
Workplace Fatigue Management monitoring system in place			
<b>Equipment (if these activities have not been conducted pre-season):</b>			
Cold temperature rated equipment in place on site			
Preventive maintenance schedules planned and implemented			
Heat Tracing materials and combustion heaters/trunking available as needed. Policy/procedures in place/understood			
Suitable mechanical and manual snow removal equipment on site			
Wind Wall and Hoarding materials available and policy/procedure for use is in place and understood			
Implement winter-version of engine idling policy (vehicles and equipment) and use of parking electrical plug ins			
Implement cold temperature equipment and vehicle refueling procedures (vapour cloud, static spark)			

## 8.7 Appendix 7: Holiday Shut-down Checklist

Winter Shut-down			
<b>Site:</b>		<b>Contractor:</b>	
<b>Date of Shut-down:</b>		<b>Completed by:</b>	
Action	Date due	Responsible party	Date Completed
Prepare contact list including: <ul style="list-style-type: none"> <li>• Client or Management</li> <li>• Service companies such as trailer, road maintenance or equipment</li> <li>• Fuel and other supply companies</li> <li>• Emergency services including Medical, fire, environmental and Security</li> <li>• Safety</li> </ul>			
Prepare and document Shut-down Plan			
Determine staffing levels, shifts that will be required and roles that will be required during shut-down			
Determine work activities that will be completed during the shut-down			
Prepare information packages for those who will work over the shut-down which includes Emergency contact info and procedures, maps, roles and responsibilities, work procedures			
Determine and complete pre-shut-down activities			
Order equipment, materials and supplies that will be required for the length of the shut-down			

Additional Notes: \_\_\_\_\_

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## 8.8 Appendix 8: Winter Season Tires








Tire type	Characteristics
<b>All Season</b>	All season tires are designed to provide enough traction for safe driving over a wide range of conditions. All season tires are made of a harder rubber compound to promote longer tread life. Harder compounds lose traction when the temperature drops below -7 to -10 °C. The tight, closed tread design provides poor traction in snow and slush when the tread face becomes packed with snow.
<b>M + S or M&amp;S</b>	Mud and Snow. These are all-season tires with a self-cleaning tread. They have above-average traction in muddy or very light snow accumulation as well as better traction at low ambient temperatures.
<b>M+SE</b>	Mud and snow tires equipped with studs
<b>Winter or Snow</b> <b>(Mountain peak/snowflake pictograph)</b> 	Winter tires are designed for use in snow and lower ambient temperatures. They have a more aggressive and open tread design to prevent snow build-up which results in superior grip. They are constructed of soft rubber that doesn't lose traction at lower temperatures
<b>Studs or chains</b>	Can be applied to any type of tire if permitted by the manufacturer.





## 8.9 Appendix 9: Insulating Value of Clothes

<b>Basic clothing ensemble: 1.0 clo</b>			
This is the clothing ensemble to be comfortable at room temperature, 20°C: under garments, short sleeved shirt and shorts or light pants			
<b>Base Layers</b>		<b>Outer Layers</b>	
Insulating socks	0.06	Boots	0.10
Long underwear: top	0.20	Thin jacket (not lined, rain coat or wind breaker)	0.36
Long underwear: bottoms	0.15	Lined jacket	0.48
Sweater	0.25	Bib overalls	0.30
Insulating shirt (Sweatshirt or flannel)	0.36	Coveralls	0.49
Insulating pants (sweatpants)	0.28	Knee length insulated jacket	0.69

These are a general values for a typical garment. Actual insulating values of the specific garments in use will be dependent on the material the garment is made of

## 8.10 Appendix 10: Traction Aid Characteristics

Characteristic	Advantages	Disadvantages
<p>Over shoe or galosh style</p> 	<p>Adds a waterproof outer to the boots</p>	<p>Some styles can be heavy Can collect snow and water between the boot and the traction aid. Once on the boot, may be difficult to remove Doesn't fit all boot styles</p>
<p>Full foot cleats</p> 	<p>Provides full foot traction Provides maximum amount of traction Comes in a variety of styles to fit most boot types. Easy to apply and remove.</p>	<p>Can't be worn on all surfaces specifically indoors or on metal.</p>
<p>Heel Cleats</p> 	<p>Can be worn to operate equipment and vehicles without becoming caught Fits all boot styles Easy to apply and remove.</p>	<p>Only traction on the heels. Wearer's heel is raised possibly causing ergonomic issues.</p>
<p>Screw in cleats</p> 	<p>Attaches directly to boot allowing for use on any type of winter footwear suitable for the task. No straps, or extra soles to become caught. Provides excellent traction on hard packed snow and ice.</p>	<p>Not easily removed for walking on hard surfaces, metal or concrete. May damage sole of boot Can create sparks on metal surfaces. Replacement needed as they can fall out easily.</p>
<p>Full foot sand paper</p> 	<p>Safe to wear indoors, or on hard surfaces. Non-sparking material. Easy to apply and remove</p>	<p>Not suitable on hard packed, icy surfaces. Frequent replacement needed as abrasive material falls off or become smooth. Only provide traction on toe and heel.</p>
<p>Wire or spring</p> 	<p>Provides excellent traction on hard packed snow and ice Don't lose shape or elasticity. Easy to apply and remove</p>	<p>Prone to becoming caught on stairs and loose ground material. Extremely slippery on hard surfaces such as metal Not suitable for driving</p>
<p>Center foot spikes</p> 	<p>Easy to apply and remove Convenient for frequent indoor/outdoor work or driving</p>	<p>Do not provide full foot traction Alter way in which boot contacts ground</p>

<p>Velcro fasteners</p> 	<p>Provide secure, snug fit Adjustable to many boot sizes Can be attached to a variety of traction aid styles</p>	<p>Velcro prone to wear and tear in wet, snowy or muddy conditions. Replacement required</p>
<p>Rubber or flexible upper</p> 	<p>Stretches over boot Fits variety of boot styles</p>	<p>Loses elasticity in the cold. Prone to stretching out and falling off. May not fit winter boots with large toe boxes.</p>
<p>Flexible rubber sole</p> 	<p>Stretch to fit a variety of boot styles and sizes</p>	<p>Loses elasticity in the cold. Prone to stretching out and falling off. Can become caught on loose ground surfaces. Not suitable for driving.</p>
<p>Hard plastic sole</p> 	<p>Aggressive tread and traction</p>	<p>Heavy. Hard plastic sole can become stiff in cold conditions. Difficult to fit all boot shapes.</p>

The above images are to depict traction aid types not to brand endorsement

## 8.11 Appendix 11: Inventory and Ordering Log

Material	Needed	On site	To be Ordered	Ordered by and date
<b>Roadways and Parking Areas</b>				
Barricades				
Signage				
Portable blinking lights				
<b>Snow Removal and Grit Application</b>				
Grader				
Loader				
Bobcat				
Sand truck				
Snow blower				
Leaf blower				
Shovels				
Brooms				
Ice scraper or chipper				
Grit				
Deicer				
<b>Buildings and Trailers</b>				
Glycol or piping antifreeze				
Anti-slip material for stairs				
Wet floor signs				
Boot brushes				
Floor mats				
<b>Hoarding and Heating</b>				
Tarps				
Wood				
Scaffolding				
Indirect fire heaters				
Heater hoses				
Air movers				
Fire Extinguishers				

<b>Lighting</b>				
Permanent lights				
Light plants				
Light bulbs				
<b>Work and Laydown Areas</b>				
Dunnage				
Delineators				
Snow Fence				
Grit boxes				
Cord stands				
<b>Vehicle Winterization</b>				
Winter grade lubricants				
Winter grade windshield washer fluid				
Winter tires				
Snow brush and ice scraper				
Windshield wipers				
Extension cords for block heaters				
Emergency kits				
Spill kits				
Spill trays				
<b>Dewatering</b>				
Pumps				
Hoses				
Silt fence				
Diffusers				
<b>PPE</b>				
Hard hat liners				
Toques				
Balaclavas				
Safety eyewear				
Gloves				
Traction aids				

<b>Winter Preparedness Campaign</b>				
Posters				
Training materials				

## 8.12 Appendix 12: Campaign Planner

Name of Campaign:	<b>Winter Work</b>		
Topic:	<b>(Message to be broadcast)</b>		
Time of Campaign:	<b>Date/Week of...</b>		
	<b>Details</b>	<b>Due Date</b>	<b>Complete (Y/N)</b>
Target Audience (Focused) :	<i>(Identify the group(s) that the campaign is focused on sites, locations, contractors, working group, etc.)</i>		
Deliverables:	<i>(what is being produced)</i> <ul style="list-style-type: none"> <li>• <i>Merchandise (stickers, magnets, key chains, hats, cups, etc.)</i></li> <li>• <i>Bulletins/Alerts</i></li> <li>• <i>Client communications</i></li> <li>• <i>Safety meeting material</i></li> <li>• <i>Handouts</i></li> </ul>		
Delivered by:	<i>(Who is involved in the delivery?)</i> <ul style="list-style-type: none"> <li>• <i>Health and Safety</i></li> <li>• <i>Supervisors</i></li> <li>• <i>Line Management</i></li> <li>• <i>Contractors</i></li> <li>• <i>Sub-Contractors</i></li> <li>• <i>Client Reps</i></li> </ul>		
Plan/Timelines:	<i>(HOW.....is there steps that need to be followed)</i> <ul style="list-style-type: none"> <li>• <i>Hold meeting by this date</i></li> <li>• <i>Contact external/internal resource</i></li> <li>• <i>Order merchandise</i></li> <li>• <i>Gather stats if applicable</i></li> <li>• <i>Additional research</i></li> <li>• <i>Prepare materials</i></li> <li>• <i>Lead time for materials, approvals</i></li> <li>• <i>Is there conflict with other initiatives?</i></li> </ul>		
Training:	<i>(is additional training required/offered)</i>		



	<ul style="list-style-type: none"> <li>• <i>Is there a link to existing training available or should there be?</i></li> </ul>		
Media to be Used:	<ul style="list-style-type: none"> <li>• <i>PowerPoint</i></li> <li>• <i>Posters</i></li> <li>• <i>Handouts</i></li> <li>• <i>Videos</i></li> </ul>		
Budget:	<p><i>(What is the estimated budget for this activity, if applicable)</i></p> <ul style="list-style-type: none"> <li>• <i>Line items</i></li> </ul>		
Risks/mitigation:	<ul style="list-style-type: none"> <li>• <i>What can derail/impact this?</i></li> <li>• <i>Shutdowns/unplanned outages</i></li> <li>• <i>Workloads</i></li> <li>• <i>External conflicts.</i></li> <li>• <i>Who can deliver if you can't?</i></li> </ul>		

## **8.13 Appendix 13: Sample Winter Campaign Materials**

The following links will provide sample Tool Box Talks, Safety Meetings and Posters to be adapted and used.

1. Exposure to Cold (PowerPoint)
2. Frostbite and Hypothermia (Word)
3. Winter Driving (PowerPoint)
4. Winter Prep Safety Meeting (PowerPoint)
5. Winter Preparedness Presentation (PowerPoint)
6. Winter Working Conditions Poster (PDF)
7. Winter Slips, Trips and Falls poster 1 (Word)
8. Winter Slips, Trips and Falls poster 2 (PDF)
9. Winter Slips, Trips and Falls pamphlet (PDF)



## Winter Surveillance Report

Surveillance Focus Area	Activity Remarks	Score*
*Scoring: 0-Not in place; 1-Poor; 2-Satisfactory; 3-Good; 4-Excellent; x-Not Applicable		
Winterization Supplies (ex. Sand bins stocked)		
Housekeeping		
Waste Materials		
Winter PPE		
Footwear/ Traction Aids		
Maintenance Construction Safeguards		
Overhead Snow/Ice		
Safety Signage/Barriers		
Policy/Procedure Compliance		
Training Practices Followed		
Pre-task Planning/ Analysis		
Ladders and platforms free of Ice/Snow		
Warm Up Shelters Provided		
Roads/Walkways Established/Delineated and Maintained		
Heat Tracing		
Combustion Heaters		
Hoarding/Wind Walls		
Area Lighting/Task Illumination		
Roads and parking plowed and maintained		
Additional Comments:		