**Editor’s note:** PASS ON EACH ISSUE OF THIS NEWSLETTER TO EVERYONE WITH SAFETY RESPONSIBILITIES AT YOUR COMPANY.

## Preventing Hypothermia, Frostbite, and Trench Foot

### Key Points
- Extended exposure to cold or freezing temperatures—or a combination of cool temperatures, wind, and moisture—can cause serious health problems, frostbite, and hypothermia including trench foot, which occurs when feet are exposed to cold and damp while in constricted footwear. In extreme cases, this exposure can be fatal. Because many workers in the landscape and horticultural services industry spend the majority of their workday outdoors, they face an increased risk of suffering cold-related illnesses compared to workers in other industries.
- Cold-related health problems can be prevented or treated early when employers, supervisors, and employees are aware of the dangers, precautions, symptoms, and first aid procedures.

### Employer and Supervisor Checklist

Follow federal OSHA’s general duty clause, which requires employers to provide a workplace free from recognizable hazards likely to cause death or serious harm to employees, and recommendations (many of which are listed below) from that agency and the National Institute for Occupational Safety and Health regarding protecting workers from environmental cold. At this time, federal OSHA does not have regulations specifically addressing cold-related illness.

- Watch for signs of cold stress in employees and allow them to interrupt their work if they experience any symptoms.
- Ensure that work schedules allow appropriate rest periods in warm areas (such as a heated vehicle).
- Provide warm, non-caffeinated liquids to workers.
- During cold months, schedule outdoor work for the warmest part of the day.
- Because energy is needed to keep muscles warm, reduce the physical demands of workers when weather conditions create a risk for cold-related illness.
- Use relief workers or assign extra workers for long, demanding jobs.
- Provide and make sure employees wear appropriate personal protective equipment (PPE). While the federal OSHA standard requiring employers to provide and pay for necessary PPE includes an exception for “ordinary weather-related gear,” be aware that providing warm hats, jackets and gloves, and boots (waterproof when necessary) can pay dividends. The cost of one trip to the hospital for a case of frostbite could cover a lot of PPE. Also remember, you’re required to provide anything that falls outside the “ordinary” category.
- Monitor workers who are at increased risk of cold stress (those who are older, have cardiovascular disease, diabetes or hypertension, or take medication that inhibits the body’s response to cold or impairs judgment).
- Train employees in cold-related illness risks, prevention, symptoms (and the importance of monitoring themselves and co-workers for symptoms), and treatment.
- Incorporate all the measures you take to protect workers from cold-related illness into relevant health and safety plans.
Employee Checklist

- Select proper clothing for cold, wet, and windy conditions.
- Layer your clothing. Wear an inner layer of synthetic fiber such as polypropylene that wicks perspiration away from skin, a middle layer of wool or synthetic fabric that absorbs perspiration and retains warmth, and an outer layer of nylon that protects against wind and allows ventilation.
- Wear headgear that also covers the ears and neck and is made of wool or a knit material with a wind-proof outer shell.
- Drink warm, non-caffeinated beverages and take short, frequent breaks in a heated space.
- Change into dry gear immediately if water gets on your body. Store a plastic bag with extra gloves, hat, socks, and a coat in the vehicle that takes you to job sites.
- Know what hypothermia is (abnormally low body temperature) and its symptoms: shivering, blue lips, trouble speaking, confusion, lack of coordination, and fatigue.
- Be aware hypothermia can occur even when temperatures are above freezing, especially if you are wearing wet clothing or are exposed to brisk winds. For example, when the temperature is 40 F and wind speed is 35 mph, conditions for exposed skin are equivalent to a still-air temperature of 11 F. See the thermometer graphic below for additional temperature/wind speed information.
- Know what trench foot is (an injury of the feet resulting from prolonged exposure to wet and cold or cool conditions) and its symptoms: reddened skin, numbness, leg cramps, swelling, and tingling pain.
- Be aware trench foot can occur at temperatures as high as 60 F if your feet are constantly wet. Wet feet lose heat 25 times faster than dry feet. To prevent heat loss, the body constricts blood vessels to shut down circulation in the feet, causing skin tissue to die.
- Know what frostbite is (injury to the body that is caused by freezing) and its symptoms: numbness, tingling or stinging, aching and bluish or pail, waxy skin.
- Notify a supervisor immediately if you experience any symptoms of hypothermia, frostbite, or trench foot.
- Use the buddy system and alert a supervisor if you notice any signs of cold-related illness in a fellow worker.
- If you experience early signs of hypothermia, go to a warm place and drink something warm. If a co-worker experiences these symptoms, help him or her do the same.
- If a co-worker’s hypothermia symptoms progress beyond shivering and blue lips, call 911. Take the person indoors, if possible, or inside a warm vehicle, remove any wet clothing, and cover him or her in layers of blankets.
- If you or a co-worker experience symptoms of frostbite, move to a warm, dry place and remove any wet or tight clothing that might cut off blood flow to the affected area. Don’t rub the area; this will cause damage to the skin and tissue. If there is not a chance the skin will become cold again, warm it by submerging the affected area in warm (105 F), not hot, water. Warming takes 25–40 minutes. When normal feeling, movement, and skin color return, dry and wrap the area. Seek medical attention as soon as possible.
- If you or a co-worker experience symptoms of trench foot, remove shoes and wet socks, dry the feet and avoid walking on them, as this could cause tissue damage. Seek medical attention as soon as possible.

See chart below.
Determining wind speed
5 mph – a light flag moves
10 mph – a light flag fully extends
15 mph – newspaper lifts off the ground
20 mph – accumulated snow is blown