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I. Introduction

Gallant Builders EH&S Office has developed this Program to protect employees who are exposed to excessive cold or who work in cold environments while at work. Various reasons can contribute to cold stress such as low air temperature, cool high wind, dampness, and cold water. Cold stress can result in hypothermia, frostbite, or trench foot.

II. Scope

This Program applies to all university employees who are exposed to or may become exposed to excessive cold during the course of performing their job duties.

III. Responsibilities

Environmental Health & Safety (EHS):

- Assisting each project site in implementing the provisions of this Program.
- Updating the Program, as necessary.
- Validating Program implementation.
- Providing training and education resources regarding cold stress; and
- Performing cold exposure assessments for employees.

IV. Protecting Employees

The EH&S Office has developed protective criteria for employees based upon the wind chill and other measures of cold stress exposure. The wind chill factor combines both air temperatures and wind speed. The lower the wind chill the colder the environment will feel and the greater the risk that employees will experience a cold-related illness.

Individual vulnerability to cold-related illness can vary widely between employees. Risk factors include wetness/dampness; proper dress; exhaustion; predisposing health conditions such as hypertension, hypothyroidism, and diabetes; and poor physical conditioning.

Employees gradually acclimatize when exposed to cold conditions. This may take several weeks. When the wind chill is low, special precautions are needed to protect un-acclimatized employees while they adjust to the cold particularly on the first few days they are exposed to cold conditions. Supervisors should monitor employees closely for signs of cold stress during this period and they should adopt appropriate work-rest schedules for these employees, starting with longer rest periods, that are adjusted over a two- week period. Re-acclimatization may also be necessary when employees are away from the cold conditions for a few days.

V. Training

Employees and supervisors working outdoors should be trained in how to recognize signs of heat/cold illnesses and what to do about it. Please review Appendix C

Illness	Signs & Symptoms	Recommended Actions
Dehydration Usually occurs when the body's output of water is greater than the body's input	-Thirsty -Lightheadedness -Muscle cramps -Headache	-Drink water or sports drinks that contain electrolytes -Drink to quench thirst
Mild hypothermia Usually occurs when the core body temperature drops between 98-90 F	-Shivering -Lack of coordination, stumbling, fumbling, hands -Slurred speech -Memory loss; and/or -Pale, cold skin	-Move to warm area -Stay active -Remove wet clothes and replace with dry clothes or blankets and cover head -Drink warm (not hot) sugary drink
Moderate Hypothermia Usually occurs when the core body temperature drops between 90-86 F	-Shivering stops -Unable to walk or stand -Confused and irrational	-All of the recommended actions for mild hypothermia plus the following: -Call 911 for an ambulance Cover all extremities completely -Place very warm objects, such as hot packs or water bottles on the victim's head, neck, cheek, and groin
Severe Hypothermia Usually occurs when the core body temperature drops between 86-78 F	-Severe muscle stiffness -Very sleepy or unconscious -Ice cold skin -Death	-Call 911 for an ambulance -Treat the victim very gently -Do not attempt to re-warm
Frostbite Usually occurs when the skin actually freezes and loses water when temperatures are below 30 F. Wind chill factor can allow frostbite to occur in above freezing temperatures.	-Cold, tingling, stinging or aching feeling in the frostbitten area followed by numbness -Skin color turns red, then purple, then white or very pale -The skin is cold to the touch -Blistering in severe cases	-Call 911 for ambulance -Do not rub the area -Wrap frostbitten area with a soft cloth -If help is delayed, immerse area in warm (not hot) water. Do not pour water on affected area -Apply sterile dressings to blisters to prevent breaking
Trench Foot Usually occurs by having feet immersed in cold water for long periods of time. Similar to frostbite but less severe.	-Tingling, itching or burning sensation -Blisters may also be present	-Soak feet in warm (not hot) water -Wrap with a soft dry cloth or bandage -Drink a warm sugary drink
Chilblains Painful inflammation of small blood vessels as a response to sudden warming from cold temperatures	-Red itchy patches of skin -Swelling and blistering on extremities -Burning sensation on skin -Changes in skin color from red to dark blue	-Chilblains will usually go away on its own, making treatment not a necessity -Keep the area warm -Use antiseptic to help reduce the chance of infection

VI. Prevention

Workers who are exposed to extreme cold temperature environments may be at risk of cold stress. Exposure to extreme cold can result in occupational illnesses and injuries. Cold stress can result in various stages of Hyperthermia, Trench Foot, Frostbite Dehydration etc.

1. It is easy to become dehydrated in cold weather. If possible, heavy work should be scheduled during the warmer parts of the day.
2. Take breaks out of the cold.
3. Try to in pairs to keep an eye on each other and watch for signs of cold stress.
4. Avoid fatigue since energy is needed to keep muscles warm.
5. If a worker exposed to cold shows signs or reports symptoms of cold stress or injury the worker must be brought into the warm area and monitored to ensure his/her safety.

6. The worker should be paced to avoid excessive sweating. If such work is necessary, proper rest periods in a warm area should be allowed.
7. New employees should be given enough time to get acclimatized to cold and protective clothing before assuming a full workload.

VII. Clothing, PPE, and Supplies

1. Proper cold weather clothing must be worn by employees when working in cold, wet, and windy conditions.
2. Cotton loses its insulation value when it becomes wet. Wool, silk, and most synthetics, on the other hand, retain their insulation even when wet. The following are recommendations for working in cold environments:
    a) Wear at least three layers of clothing. An inner layer of wool, silk or synthetic to wick moisture away from the body – a middle layer of wool or synthetic to provide Insulation even when hot - an outer wind and rain protection layer that allows some ventilation to prevent overheating.
    b) Wear a hat or hood.
    c) With the exception of the wicking layer do not wear tight clothing. Loose clothing allows better ventilation of heat away from the body.
    d) Do not underestimate the wetting effects of perspiration. Often wicking and venting of the body's sweat and heat are more important than protecting from rain or snow.
    e) Wear insulated boots or other footwear.
    f) Liner socks made from polypropylene will help keep feet dry and warmer by wicking sweat away from the skin. Always wear the right thickness of socks for your boots.
    g) Clothing must be dry. Moisture should be kept off clothes by removing snow prior to entering indoors.

VIII. First Aid

1. Hypothermia- When normal body temperature (98.6°F) drops to 95°F or less. Mild symptoms may include being alert but shivering. Moderate to severe symptoms: shivering stops; confusion; slurred speech; heart rate/breathing slow; loss of consciousness; death. Call 911 immediately in an emergency. To prevent further heat loss:
    a) Move the worker to a warm place.
    b) Change to dry clothes.
    c) Cover the body (including the head and neck) with blankets, and with something to block the cold (e.g., tarp, garbage bag). Do not cover the face.

2. Frostbite symptoms- numbness; reddened skin develops gray/white patches; feels firm hard and may blister. Action that should be taken:
    a) Move worker to a warm place.
    b) Do not rub the frostbitten area.
    c) Avoid walking on frostbitten feet.
    d) Do not apply snow/water.
    e) Do not break blisters.
    f) Loosely cover and protect the area from contact.
    g) Do not try to rewarm

3. Dehydration- Extreme thirst, irritability, and confusion; Dry mouth, skin, and mucous membrane; little or no urination, and any produced will be darker than normal; Sunken eyes.
   Action that should be taken:
   a) Have employee drink fluids.
   b) Call 911

IX. Risk

Workers who are exposed to extreme cold may be at risk of cold stress. Hypothermia, frostbite, trench foot and chilblain are all examples of illness that can be caused by extremely cold or wet weather whenever temperatures drop. These weather-related conditions may lead to serious health problems.

X. Types

The winter season brings a variety of adverse weather extremes. You may experience heavy snow, ice accumulation, freezing temperatures and wind chill.