

Weather Extremes

1. Introduction

The purpose of this document is to provide guidance on Weather Extremes for reference when planning for emergencies at a workplace or project. This information is not exhaustive or a direction and the project should fully inform itself on project or workplace specific hazards, risks and suitable risk controls. This document intends to provide practical guidance for managing weather extremes. This document can also be used as the tool box communication to those working on site to promote awareness of the dangers associated with weather extremes.

2. Guidance Material

The risk associated with Weather Extremes should be assessed in the Project and Workplace Risk Assessment; controls should be listed in the workplace emergency response plan and appendices.

LIGHTNING AWARENESS AND STRIKE MANAGEMENT

Lightning kills about 24000 people in the in the world each year and injures approximately 240,000.

Among construction workers, surveyors, labourers, machine operators, engineers, roofers, and pipefitters have been struck by lightning most often on the job.

In most places, lightning hits most often in late afternoon in spring and summer. But lightning can hit anyone in the wrong place at the wrong time. Lightning can hit the same place many times too. Lightning can stop your heart and kill you. But you can also get burns, nervous system damage and other health problems. Some of these you may not notice until months after a lightning strike.

Means of measurement and tracking storms

The most reliable method to see if a storm with lightning is approaching is via the radar image, for example <http://www.bom.gov.au/products/IDR633.loop.shtml> website in the Darwin Region.

Should the internet be unavailable for any reason, the F-B (flash to boom) method can be used to gauge distance to a lightning strike. To use the method, count the seconds between the lightning flash and thunder. Divide by 3 to determine the distance in kilometres. Immediate precautions against lightning should be taken if the F-B time is 25 seconds or less, that is, the lightning is closer than 8 km. Do not rely on the F-B method for determining when to relax the safety measures, because lightning typically occurs in multiple locations, and just because some strikes are far away does not prevent another strike nearby. Precautions should not be relaxed until thunder cannot be heard for 30 minutes, at any distance.

If you hear thunder and see lightning, act right away – especially if you count 30 seconds or less between the thunder and lightning. If the thunder gets louder or you see the lightning more often, the storm is getting closer. (Sometimes lightning will strike out of a sunny sky 10 km or more from a storm.)

Consider the following if an electrical storm is near:

DO NOT:

- Be the tallest object in an area.
- Stand out in the open.
- Stand under a tree. (If the tree is hit, you can be too.)
- Stand in a gazebo or open shelter, like a bus shelter.
- Stand next to metal objects – pipes or light poles or door frames or metal fences or communication towers – indoors or out.
- Work on or from scaffolds, roofs or elevated positions in storms
- Stay next to water – ponds or running water – indoors or out. (Do not take a shower or use running water.)

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- Use plug-in power tools or machines – indoors or out.
- Use a plug-in telephone (or a computer with a modem) – indoors or out.
- Lie flat on the ground.
- Go back to work outdoors until a half-hour after the lightning and thunder stop.

DO:

- Get into an enclosed building – like a building or office. Avoid metal including fixings.
- Get into a car, van, truck, or bus with the windows closed all the way. Do not touch the doors or other metal inside. (Open cabs on heavy equipment will not protect you. Rubber tyres will not protect you.)
- Lower Crane jibs, Concrete Pump Boom Arms, Elevated Work Platforms and Plant arms/buckets
- Leave survey staffs, shovels, crow bars, any metal object on the ground and make your way to shelter. Do not carry metal objects with you.
- If you are out in the open and have nowhere to go, squat down with your feet together and only let your feet touch the ground. Put your hands over your ears (to protect against noise). That way, you are so low the lightning may hit something else. By not touching much of the ground, you have less chance that the lightning will move across the ground to you. Do not lie flat on the ground.

If someone is hit by Lightning

Call emergency services (000).

A person injured by lightning does not carry an electrical charge, and can be safely handled right away to apply first aid before emergency services arrive. Lightning can affect the brainstem, which controls breathing. If a victim appears lifeless or has no pulse, it is important to begin CPR (cardio-pulmonary resuscitation) immediately to prevent death by suffocation. If there's a portable defibrillator on hand, follow the instructions.

Be careful about staying in the open in a storm to take care of the victim – or you can get hit too. If you can, move the victim to a shelter.

HOT & COLD WORKING ENVIRONMENTS

Laing O'Rourke respects that each individual is unique and some working environments may affect some workers in different ways. Laing O'Rourke will not discriminate against individual workers. Work in hot and cold environments should be planned so that the needs of individual employees are considered.

- Physical or medical health conditions that may increase the effects of heat or cold
- Medication that a worker may be taking
- Experience in and acclimatisation to the working environment
- Previous reactions to hot or cold conditions

Any persons suffering from symptoms of hot or cold working environments must report to the first aid for immediate assistance. The First Aider in consultation with the affected worker will determine the first aid procedures needed.

Risk Assessment

The working environment and the effects of heat and cold should be considered and included in the project risk assessment. Points to consider include:

- Air temperature
- Humidity
- Air movement

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- Potential sources of heat or cold
- Number of people involved
- Type and intensity of work undertaken
- Work practices in use
- Type of plant, machinery and equipment to be used
- Premises and working environment including their layout or condition
- Capability, skill, experience and age of people doing the work
- Level of fluid loss and replacement
- Clothing and PPE issue and use must comply with LOR Health and Safety Standard for Personal Protective Equipment, as well as relevant Australian Standards including:

Hot Working Environment

The temperature of the human body is maintained at about 37.8C. In hot or humid conditions people are at risk of a range of adverse heat related conditions that may lead to Heat Stress - a general term, which describes a variety of symptoms, produced when the human body is exposed to a combination of heat and work which interferes with the body's ability to dissipate the heat energy. Heat stress is a function of total heat load and includes the level of activity and environmental conditions. Persons exposed to direct sunlight are also at risk of sunburn and skin cancers from ultraviolet radiation.

Employees working in hot conditions should be aware of the following conditions:

Heat discomfort: This is not an illness. There is a feeling of flushed skin and increased sweating.

Heat rash: Also known as "prickly heat". A skin rash is caused by excess sweating with all the skin wet from sweat. The rash usually disappears with acclimatisation or removal from heat.

Heat cramp: There are painful muscle cramps of the limbs and / or abdominal, muscle, twitching, tingling of pins and needles in hands and feet. The person may experience tiredness and nausea. The symptoms may be due to a salt imbalance.

Heat exhaustion: Heat exhaustion may take days to develop and be characterised via a progressive declining work performance, lack of appetite, headache, cold clammy, pale skin, rapid weak pulse, nausea and vomiting. Person may collapse.

Heat Stroke: This is serious life threatening medical condition. The person has a temperature in excess of 40C, sweating often stops, skin is hot, rapid pulse, and there may be dizziness, weakness, headache, and nausea. The person may be aggressive, irritating and convulsing. Urgent medical condition must be sought.

Controls

Working conditions, temperature, humidity and workers' physical response to the environmental conditions shall be monitored and appropriate controls put in place. Controls may include the following:

- Use mechanical aids to reduce work effort required
- Isolate workers from heat sources or move workers to cooler work areas
- Removal of heat by exhausts
- Use fans or ventilation to circulate airflow
- Provide areas protected from the heat source such as shade shelters or air-conditioned rooms
- Reduce heat from plant and processes as far as possible by insulating plant, pipes, walls or roofs to minimise radiant heat.
- Provide cool water, electrolyte replacement drinks and ice machines

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- Organise the work so those tasks requiring greater physical exertion are undertaken in cooler periods within the working shift.
- Provide rest breaks to suit the temperature and humidity
- Rotate work in hot conditions to limit the exposure of individual employees.
- Give adequate opportunity for employees to acclimatise to work environment
- Wearing appropriate clothing and PPE; long sleeved shirts, long pants, wide brims for helmets. Clothing should be rated to provide good protection against UV radiation and be ventilated where possible.
- Apply SFP 30+ broad spectrum sunscreen to areas not covered by clothing
- Provide employees with information about the effects of heat and how to recognise symptoms of heat stress.
- Encourage employees to monitor each other for signs of heat stress

Laing O'Rourke encourages workers on all projects to ensure they do not put themselves at risk of heat related illness. To this end, information and training should be provided to at risk workers to enable them to recognise the symptoms of heat related illness. Consultation with employees during the identification of thermal hazards within the work environment, the evaluation of risks and the implementation of appropriate control measures is advised.

Cold Working Environments

Symptoms of the effects of cold working environments may include: the extremities of the body becoming numb, excessive shivering, blurred and slower speech, and loss of co-ordination and difficulty to think clearly.

Laing O'Rourke encourages all our employees to ensure they do not put themselves at risk of cold related illness.

Controls

To prevent the early symptoms, Laing O'Rourke encourage their employees to-

- Wear appropriate warm clothing as provided e.g. long trousers and jackets.
- Wear gloves when required (provided)
- Relocate out of cold areas e.g. strong winds
- Take rest breaks out of the cold when required

3. Regulations and Codes of Practice

Work Health & Safety Regulation 2011 Chapter 3, section 40 (f)

W.A. Occupational Safety and Health Regulations 1996, Part 3.15 Air Temperature

Hong Kong Guides

[Guidelines on Site Safety Measures for Working in Hot Weather](#)

[Prevention of Heat Stroke at Work in a Hot Environment](#)

[Risk Assessment for the Prevention of Heat Stroke at Work](#)

[Checklist for Heat Stress Assessment at Construction Sites](#)

[Health Guide for Working during the Cold Weather](#)