	Raha International School		
	Occupational Safety and Health Management System		
	Inclement Weather Procedures		
	Document No: RIS-OSH-P09-SOP21		



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1. Purpose

The purpose of this procedure is to ensure that the staff and students have the required care and protection against severe weather and temperature at all times.

2. Scope

This procedure applies to all the Staff and Students of Raha international School.

3. Definition

Inclement weather

is abnormal climatic weather conditions: e.g., heat, cold, rain, wind, fog that prevents employees undertaking their duties safely.

UV Index

is defined as; an international system for reporting UVR intensity.

Heat stress


is the total heat burden to which the body is subjected by both external and internal factors; whether or not it results in adverse effects depends on the level of heat stress and the effectiveness of the body's cooling mechanisms

4. Responsibilities

4.1 HSE Officer

- Ensure the procedure is implemented and communicated to all staff and contractors.
- Provide information, training, instruction and supervision in the use, maintenance and disposal of personal protective equipment (PPE) and emergency equipment
- Provide instruction and training for working in extreme conditions.
- Monitoring forecast adverse weather conditions and, where these conditions occur, performing a risk assessment and implementing controls.
- Organizing the issue of any necessary PPE for all workers under their supervision.
- Identify hazards, assess risks and implement controls for workers working in extreme conditions
- Consult with workers on decisions that may affect their health and safety at work
- Eliminate or control damage to equipment, resources and property
- Ensure that work is undertaken in compliance with approved safe work method statements (SWMS)

4.2 Employees(s) & Contractors

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- Complying with this policy
- Wearing appropriate clothing at all times when advised by the HSE dept.
- Advising their Supervisor of any medical condition that may be aggravated by adverse conditions.

1.0 Procedure

5.1 General

Once OSH risks are identified, the most important step in the risk management process is to eliminate those risks. If that is not reasonably practicable, minimize the risks as much as possible.

Hazards related to working in extreme conditions can be controlled by a number of measures. Head of Department should refer to the procedure Risk management

5.2 Identification

Weather conditions should be monitored on routinely basis. In the event of the identification of adverse weather or a risk assessment should be conducted by the concerned Head of Department and HSE Officer. The following risk factors, among others, shall be considered whilst planning work schedules.

- Air temperature
- Humidity
- Radiant Heat
- Rainfall
- Wind Conditions
- Fog or Mist

5.3 Typical example of a heat stress situation

Employees performing heavy work in hot and humid conditions could be at risk of heat stress because:

- Sweat evaporation is restricted by the type of clothing and the humidity of the environment.
- Heat will be produced within the body due to the work rate and if insufficient heat is lost deep body temperature will rise.
- As deep body temperature rises the body reacts by increasing the amount of sweat produced, which may lead to dehydration.
- Heart rate also increases which puts additional strain on the body.
- If the body is gaining more heat than it can lose then the deep body temperature will continue to rise. Eventually it reaches a point where the body's control mechanisms start to fail. The symptoms will get worse the longer someone remains working in the same conditions.




Figure 1. Examples of heat-related illness risk factors

5.4 Effects of Heat Stress

Heat stress can affect individuals in different ways and some people are more susceptible to it than others. Typical symptoms are:

- an inability to concentrate;
- muscle cramps;
- heat rash;
- severe thirst – a late symptom of heat stress;
- fainting;
- heat exhaustion – fatigue, giddiness, nausea, headache, moist skin;
- heat stroke – hot dry skin, confusion, convulsions and eventual loss of consciousness. This is the most severe disorder and can result in death if not detected at an early stage.

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5.5 Control

The hierarchy of control is to be utilized when assessing the control measures to be implemented. Whilst scheduling work for such locations/situations where inclement weather conditions are anticipated, consideration should be given to and, where practicable, implement the following

- Rotation of workers engaged in heavier tasks.
- Modifying the rate at which work is performed.
- Altering the location of work.
- Where possible, provision of alternate work under weather shelters.
- Ceasing work outside during electrical storms
- Modification or re-scheduling of work or tasks (with planned work breaks).
- Provision of appropriate protective safety clothing and equipment.
- Provision of cool drinking water.
- Air-conditioned buildings and vehicles

If required PPE will be worn to minimize risk to employees.

	Cause	Symptoms	Treatment	Prevention
Heat Rash	Hot humid environment; plugged sweat glands.	Red bumpy rash with severe itching.	Change into clean dry clothes often and avoid hot environments. Rinse skin with cool water.	Wash regularly to keep skin clean and dry.
Heat Cramps	Heavy sweating from strenuous physical activity drains a person's body of fluid and salt, which cannot be replaced just by drinking water. Cramps occur from salt imbalance resulting from failure to replace salt lost from heavy sweating.	Painful cramps commonly in the most worked muscles (arms, legs or stomach) which occur suddenly at work or later at home. Heat cramps are serious because they can be a warning of other more dangerous heat-induced illnesses.	Move to a cool area; loosen clothing, gently massage and stretch affected muscles and drink cool salted water (1/4 to 1/2 tsp. salt in 1 litre of water) or balanced commercial fluid electrolyte replacement beverage. If the cramps are severe or don't go away after salt and fluid replacement, seek medical aid. Salt tablets are not recommended.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Fainting	Fluid loss, inadequate water intake and standing still, resulting in decreased blood flow to brain. Usually occurs in unacclimatized persons.	Sudden fainting after at least 2 hours of work; cool moist skin; weak pulse.	GET MEDICAL ATTENTION: assess need for CPR. Move to a cool area; loosen clothing; make person lie down; and if the person is conscious offer sips of cool water. Fainting may also be due to other illnesses.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Move around and avoid standing in one place for too long. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Heat Exhaustion	Fluid loss and inadequate salt and water intake causes a person's body's cooling system to start to break down.	Heavy sweating; cool moist skin; body temperature over 38°C; weak pulse; normal or low blood pressure; person is tired and weak, and has nausea and vomiting; is very thirsty or is panting or breathing rapidly; vision may be blurred.	GET MEDICAL ATTENTION: This condition can lead to heat stroke, which can kill. Move the person to a cool shaded area; loosen or remove excess clothing; provide cool water to drink; fan and spray with cool water. Do not leave affected person alone.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Heat Stroke	If a person's body has used to all its water and salt reserves, it will stop sweating. This can cause the body temperature to rise. Heat stroke may develop suddenly or may follow from heat exhaustion.	High temperature (over 41°C) and any one of the following: the person is weak, confused, upset or acting strangely; has hot dry, red skin; a fast pulse; headache or dizziness. In later stages, a person may pass out and have convulsions.	CALL AMBULANCE. This condition can kill a person quickly. Remove excess clothing; fan and spray the person with cool water if the person is conscious.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.

5.6 Fluid Replacement

The table below shows the fluid intake required to replace sweat at different workloads and conditions. As a general guide, work in hot weather requires an intake of 2 liters every 2-3 hours.

TWL	Fluid replacement per hour (litres)			
	Level 1 ($< 140 \text{ W.m}^{-2}$) sitting/standing light hand/arm work	Level 2 ($140\text{-}180 \text{ W.m}^{-2}$) sitting/standing heavy arm work, walking with light arm work	Level 3 ($180\text{-}220 \text{ W.m}^{-2}$) walking/moderate lifting or pushing	Level 4 ($> 220 \text{ W.m}^{-2}$) carrying/climbing/ whole body work
≤ 115	$> 1.2^*$	$> 1.2^*$	$> 1.2^*$	$> 1.2^*$
116-140	1.0 - 1.2	$> 1.2^*$	$> 1.2^*$	$> 1.2^*$
140-180	0.8 - 1.0	1.0 - 1.2	$> 1.2^*$	$> 1.2^*$
180-220	0.5 - 0.8	0.8 - 1.2	1.2	$> 1.2^*$
> 220	0.3 - 0.5	0.5 - 0.8	0.8 - 1.0	1.2

Key	
	Extreme thermal stress. Essential maintenance and rescue work only
	Workload exceeds TWL. Work-rest cycling must be applied
	High thermal stress. No worker to work alone
	Moderate thermal stress. No unacclimatised worker to work alone
	Low thermal stress. Unrestricted self-paced work

* At high workloads and/or high thermal stress, sweat rates can exceed 1.2L/hr. Increasing fluid intake much above this level is not practical due to gastric discomfort as the upper limit for gastric emptying and fluid absorption is $\sim 1.5 \text{ L/hr}$. In these situations if the workload exceeds TWL and even with adequate fluid replacement heat storage will limit work time as other factors prevent achievement of heat balance.

5.7 Working in Hot Condition

The HSE Dept. shall establish acclimatization program for new employees, employees that have been on vacation, and employees that are moving from a worksite that has climate control to a worksite that has high temperatures with an allowance of 5-7 days for acclimatization before starting hard work in a hot environment in summer.

Acclimatization Guidelines		
Activity (percent of full work assignment)		
Day	Experienced Employee	New Employee
1	50%	20%
2	60%	40%
3	80%	60%
4	100%	80%
5	100%	100%

As far as deemed applicable, the management of the school shall develop and apply a process for assessing environmental conditions utilizing the Thermal Work Limit (TWL) to determine work/rest breaks and water consumption requirements for employees.

The HSE Dept. shall implement a system to communicate current environmental conditions to employees so they can take the appropriate control measures to prevent heat stress injuries and illnesses. In addition, there shall be a communication system to inform/remind employees, employees returning from vacation and visitors to the site of the hazards of heat stress, signs and symptoms of heat stress, and steps to be taken to prevent heat stress.

The HSE Dept. shall ensure provision of appropriate amounts of potable drinking water close to the worksite and appropriate electrolyte replacement drinks, as per guidance from a qualified physician, for employees working in high temperature environments and implement programmed drinking where appropriate every hour to encourage appropriate fluid intake.

The management shall also ensure provision of appropriate clothing (e.g. lightweight, cotton, light-colored, loose-fitting - unless using machinery) and personal protective equipment including a large personal water container (of at least one liters in size). Shared drinking cups, water bottles, or other such devices are not allowed.

The School Management shall ensure provision for design and placement of shade and cooling shelters for employees working outside during summer months and appropriate cooled accommodation / shelter for the summer months during the midday break periods set by the Ministry of Labour.

The HSE Dept. shall implement the pre-employment screening and medical clearance for any employee working in high temperature environments to identify any chronic medical condition (e.g. high blood pressure, obesity) or use of prescription drugs which may affect their resistance to heat stress (consult a doctor);

During summer and the warmer months, or in any situation where increased bodily heat may arise, workers working outdoors shall ensure they consume frequent small drinks of water to maintain fluid levels appropriately and to minimise any adverse effects of heat. In hot working conditions, including high humidity, Head of Departments should consider the following control measures:

Control Level	Control
Eliminate	<ul style="list-style-type: none"> ▪ Remove workers from the conditions, whenever reasonably practicable.
Substitute	<ul style="list-style-type: none"> ▪ Use machines, where practical, to reduce manual labour ▪ Schedule heavy work and tasks that require hot or heavy personal protective equipment (PPE) for cooler times of the day (or year).
Isolate	<ul style="list-style-type: none"> ▪ Isolate workers from heat sources, where possible

	<ul style="list-style-type: none"> ▪ Ensure that heat from plant and processes are reduced as far as possible by insulating plant, pipes, walls or roofs to minimise radiant heat.
Engineering	<ul style="list-style-type: none"> ▪ Remove heat from buildings by using extraction fans or similar devices ▪ Ensure that work areas are ventilated to provide adequate airflow ▪ Ensure vehicles are fit-for-purpose and fitted with effective climate control.
Training and Administrative	<ul style="list-style-type: none"> ▪ Ensure there is sufficient support for workers who may suffer from heat exposure ▪ Allow workers to acclimatise before undertaking a full workload ▪ Shorten the duration of each exposure (more short exposures, fewer long exposures) ▪ Provide frequent rest breaks and rotate duties to allow people to cool down ▪ Ensure there is sufficient cool drinking water available at workplaces ▪ Provide cool areas for rest and recovery, where possible ▪ Avoid assigning workers who have medical conditions to tasks that may put them at risk ▪ Consider the impact of hot conditions when developing safe work method statements (SWMS) or other safe working procedures ▪ Develop procedures for regular contact between workers likely to be working in extreme temperatures and the office or depot ▪ Monitor temperature, humidity and workers' physical response to environmental conditions ▪ Train employees to recognize symptoms of heat-related illnesses
PPE	<ul style="list-style-type: none"> ▪ Encourage the wearing of lightweight, loose fitting clothing in hot or humid climates (as long as this does not introduce more risk) ▪ Use general radiant heat protection (hat, sunglasses, sunscreen, sun protective clothing and shade, where possible).

5.8 Determination of TWL

The Thermal Work Limit (TWL), which has been validated for Gulf conditions, is the heat stress index that has been researched and adopted by within the Emirate of Abu Dhabi to enable safe management of work in heat. It gives a measure of the maximum safe work rate for the conditions. If TWL is too low then even low rates of work cannot safely be carried out continuously.

TWL, measured in watts per square meter (W/m^2), is the maximum rate at which heat can be lost to the environment in the conditions. TWL is calculated from environmental parameters assuming that employees are well hydrated and acclimatized to the conditions and are self-paced.

To determine TWL the following must be measured:



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Dry Bulb Temperature (ambient air temperature)	in degrees °C
Wet Bulb Temperature (determined by the humidity/evaporation)	in degrees °C
Globe Temperature (determined by the radiant heat)	in degrees °C
Wind speed	in meters per second

Instruments are available that carry out all of these measurements and internally compute the TWL.

Alternative single instruments measuring Dry Bulb (air temperature), Globe Temperature (radiant heat), Wet Bulb (evaporative cooling) and Air Velocity (wind speed) can be used and individual readings entered into the online Thermal Work Limit calculator available at: [to calculate the overall TWL heat stress index result and working zone.](#)

Thermal Work Limit - Working Zones


Control Interventions, Rest-Work and Rehydration Schedules

Working Zones	Interventions	Rehydration Schedule (per hr)	Work-rest Schedule (minutes)
Low Risk Unrestricted Zone TWL: 140 - 220 <	No limits on self-paced work^a for educated, hydrated workers.	Light Work 600 ml - 1 Litre / hr	Safe for all continuous self-paced work^a
Medium Risk Cautionary Zone TWL: 115 – 140	Cautionary zone indicates situations in which environmental conditions require additional precautions. <ul style="list-style-type: none"> Practicable Engineering control measures to reduce heat stress should be implemented e.g. provide shade, improve ventilation etc. Working alone to be avoided No unacclimatised person to work^b Ensure adequate fluid intakes appropriate for type of work 	Light Work 1 -1.2 Litres / hr	Safe for continuous self-paced light work^a
		Heavy Work > 1.2 Litres / hr *	Continuous paced work 45 work - 15 rest
High Risk Zone TWL: < 115	<ul style="list-style-type: none"> Strict Work/Rest cycling required No person to work alone No unacclimatised person to work^b High Risk induction required emphasising hydration and identifying signs of heat strain Provide personal water bottle (2 litre capacity) on-site at all times 	All Work >1.2 Litres / hr *	Light work ^c 45 work – 15 rest
			Heavy work ^d 20 work - 40 rest

5.9 Emergency First Aid

Following is the procedure to be followed when a person suffers severe heat-related symptoms:

- Ring the emergency number or contact HSE officer;
- If possible remove them to a cool area;
- Sit or lie person down, elevate legs if they have fainted;
- If they are conscious give them water or electrolyte drink to be drunk slowly;
- Cool the person down by sprinkling water on them, place a cold towel on the head, or direct a fan on them. Don't throw ice/ice cold (chilled) water on them;
- If there's no quick recovery, place them in the "recovery" position and monitor Airway, Breathing & Circulation (ABC);

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- Wait with them for assistance to arrive.

5.10 Monsoon Conditions

The potential hazards present on a worksite can be exacerbated during inclement conditions such as rain. Working in the rain can cause slippery surfaces and limited visibility. However, steps can be taken to mitigate such hazards. Property damage from rain can add both cost and time to a school. While it's not possible to fully predict and react in a timely fashion to storms, a documented and practiced contingency plan can help contractors prepare for the unexpected. The facilities Manager / HSE Officer shall protect school premises by evaluating site-specific risks, properly securing materials and equipment and anticipating alternate construction plans.

5.10.1 Preparation

With the materials around on construction sites, inclement weather can present a safety risk to employees. When alerted to rainy weather in the area, workers can place protective sheets on scaffolding and remove loose items such as tools. Items can be stored in areas that are protected from flooding. Also, structures should be tied down. These tasks can protect school premises from property damage as well as injuries.

5.10.2 Response

A water damage response plan, including equipment, should be readily available to identify and arm resources with a swift-response guide to help address the water issue before it spreads.

5.10.3 Utilize a Weather Forecasting Service

Since weather can have a major impact on school schedules, it's important to use a professional weather forecasting service that can predict when storms will arrive in the area. This service should be able to provide mobile alerts and satellite imagery so that staff and contractors can receive up-to-date, detailed information about local weather. This way, materials can be protected and school schedules can be adjusted.

5.10.4 Working in Rain

Staff and children safety should be the top priority on school, regardless of the weather. It should come as no surprise, then, that HSE Dept. has prepared a guide to prevent slips and falls caused by wet conditions, as well as for the prevention of winter-related injuries due to cold stress, such as frostbite and hypothermia. When employees and contractors working in the rain, the following is recommended:

a. General Precautions

- Cleaning of all drains in and around school premises.

- Backfilling of unwanted pits and barricading, shoring / benching & regular de-watering in all balance pits where work is going on.
- Repair of approaches to School area, if required.
- Stacking of material over sleepers.
- Safe approaches for vehicles etc.
- Proper and safe storage arrangements
- All PPE's and tools to be stored in a dry place.
- Adequate materials for monsoon repair work etc.
- Maintain adequate the first aid kits.
- Tell all to avoid using slippery roads, if unavoidable, use with utmost care.
- Provide shed / rain coat for staff and children to protect themselves during rain

b. Slippery When Wet

The slightest amount of rain can make walkways and roofs very slippery. The school should ensure proper cleaning and housekeeping, also the use of anti-slip mats wherever required.

c. Lightning Strikes

During thunderstorms staff, contractors and students should be cautious of exposed steel structures which can become impressive lightning rods.


d. Live Wires.

Wet weather increases the chances of dangerous live wires. Staff, contractors and students should always be cautious around live wires, but you should have heightened awareness and alert others to electrical cables that can become live during rainy days.

5.10.5 Other Precautions

a. Electrical Precautions

- Check for water accumulation around electrical installation like meter room, main distribution board, etc., if required elevate the level for safer approach.
- Caution all for keeping away from any installation in or near meter room if the wall is wet.
- Provide shed / cover over all distribution & sub-distribution boards.
- Check all the temporary joints and make them waterproof to the extent possible and never allow any temporary joint in water.
- Poles installed for overhead cabling - make them rigid / more stable.
- Provide glass cover for Light fittings for avoiding water entry.
- Avoid / arrest water leakage in all offices / buildings as this may cause electrical faults / short-circuit in the electrical system.

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- Only licensed / authorised electricians shall handle live electric wires, switches or connections. While carrying out repair work, a rubber mat will be used by all electricians.
- All poles should be well driven into ground to prevent these falling down due to wet and loose earth.

b. Working at height

- All height work to be stopped in severe windy conditions
- Work shall be stopped if the wind velocity crosses 30km / hr.


c. Flooding at School

- Prevent contamination of drinking water.
- Ensure collection and disposal of food waste & garbage regularly.
- Ensure all wires / cables are not laid on sharp edges to prevent damage to insulation. If, possible route through conduit pipes and support wire / cables by suitable hook.
- Ensure all wire / cable joints are water and shock proof to prevent from shock.

5.11 Training

To ensure the effective implementation of these procedure trainings shall be conducted to all personnel by HSE Dept. The training shall include the following

- How to contact emergency services
- How to drive to the specific conditions (for example, rainy and we roads, foggy conditions, extreme heat)
- Emergency procedures
- An employee's responsibility to avoid exposure to extreme conditions
- First aid procedures for the specific conditions (for example, heat exhaustion, hypothermia, fatigue)
- How best to cope with working in the extreme environmental conditions and how to deal with the related illnesses and effects
- Information on the hazards of working in extreme environmental conditions
- Information on the selection, use, fitting and maintenance of appropriate PPE and safety equipment
- Identification of predisposing factors, danger signs and symptoms of the specific extreme environmental condition
- Risk assessment procedures
- Hazard control measures
- Safe work method statements (SWMS) relating to work conducted in the extreme environmental conditions.

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Records	Responsibility	Retention period
Training records	HR/HSE Head	At least 5 years

2.0 Reference

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3. OSHAD-SF – Technical Guideline Safety in the Heat
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6. National Institute for Occupational Safety and Health (NIOSH). Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments. DHHS (NIOSH) Publication No. 2016-106, February 2016.