



CIC Seminar :

Site Safety Measures for

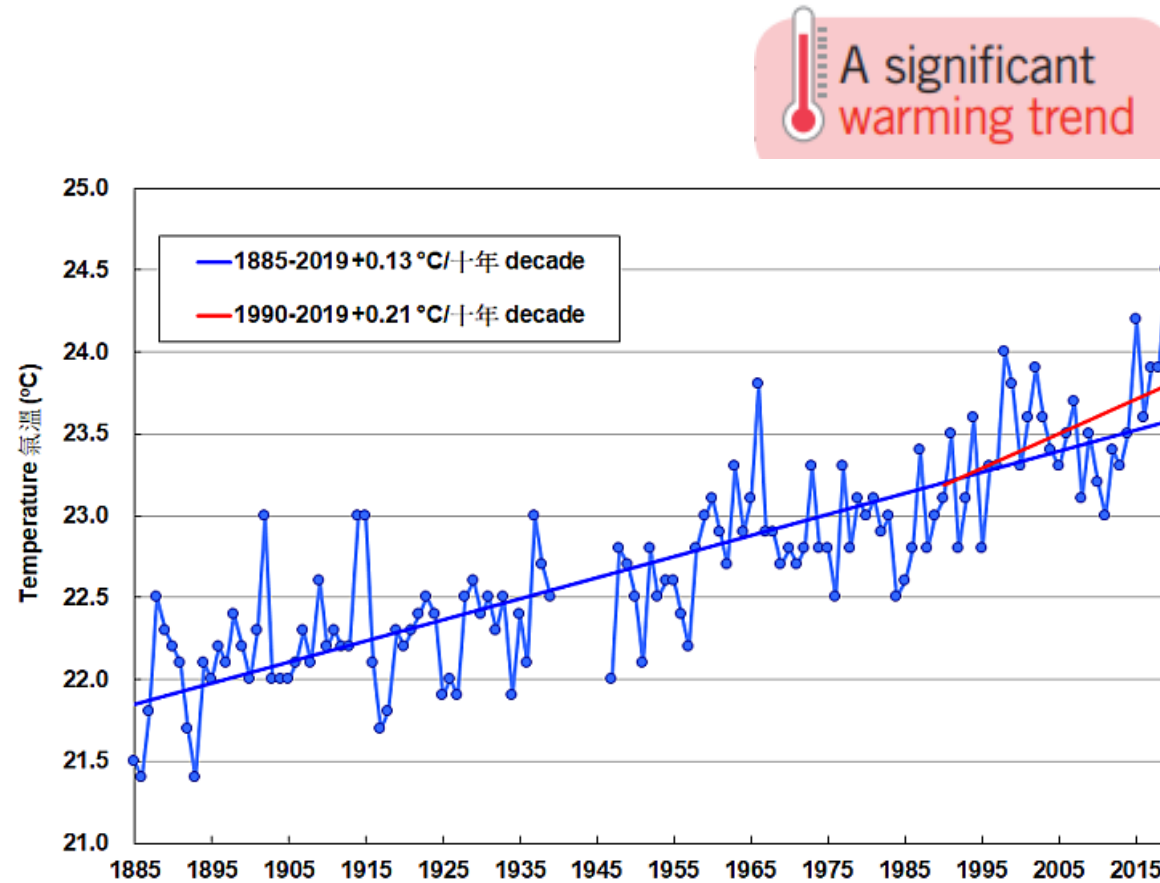
Working in Hot Weather

TOPIC:

MEASURES FOR WORKS UNDER HOT WEATHER
23-04-2020

KEITH KAN
SAFETY MANAGER
HIP HING CONSTRUCTION CO., LTD.

1) Extreme Climate in Hong Kong



Contribution Factor:

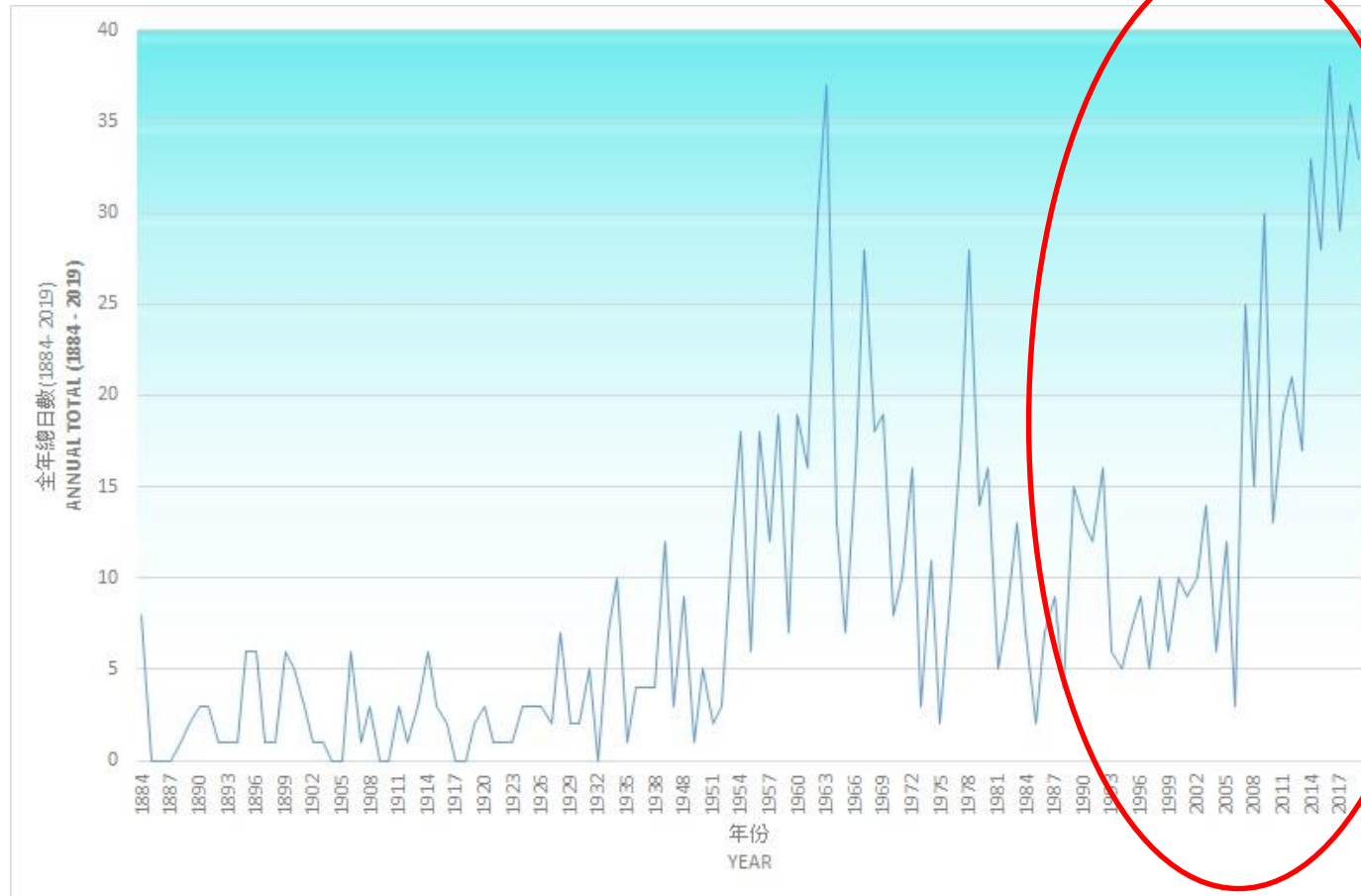
1. Global warming
2. Effects of local urbanization

Figure 1. Annual mean temperature recorded at the Hong Kong Observatory Headquarters (1885-2019).

1) Extreme Climate in Hong Kong



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Dramatic
increase over the
past 20 years



Approximate
over 33°C

Figure 2. Total number of very hot days observed
at the Hong Kong Observatory

2) Relation of Climate between HK Construction Industry



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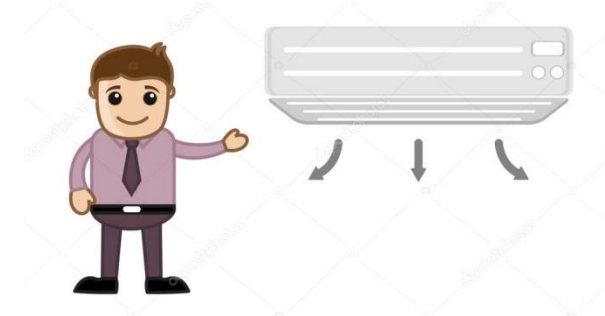
HK Construction Industry



Mainly:

- Outdoor works
- Manual Works
- Long Working hours

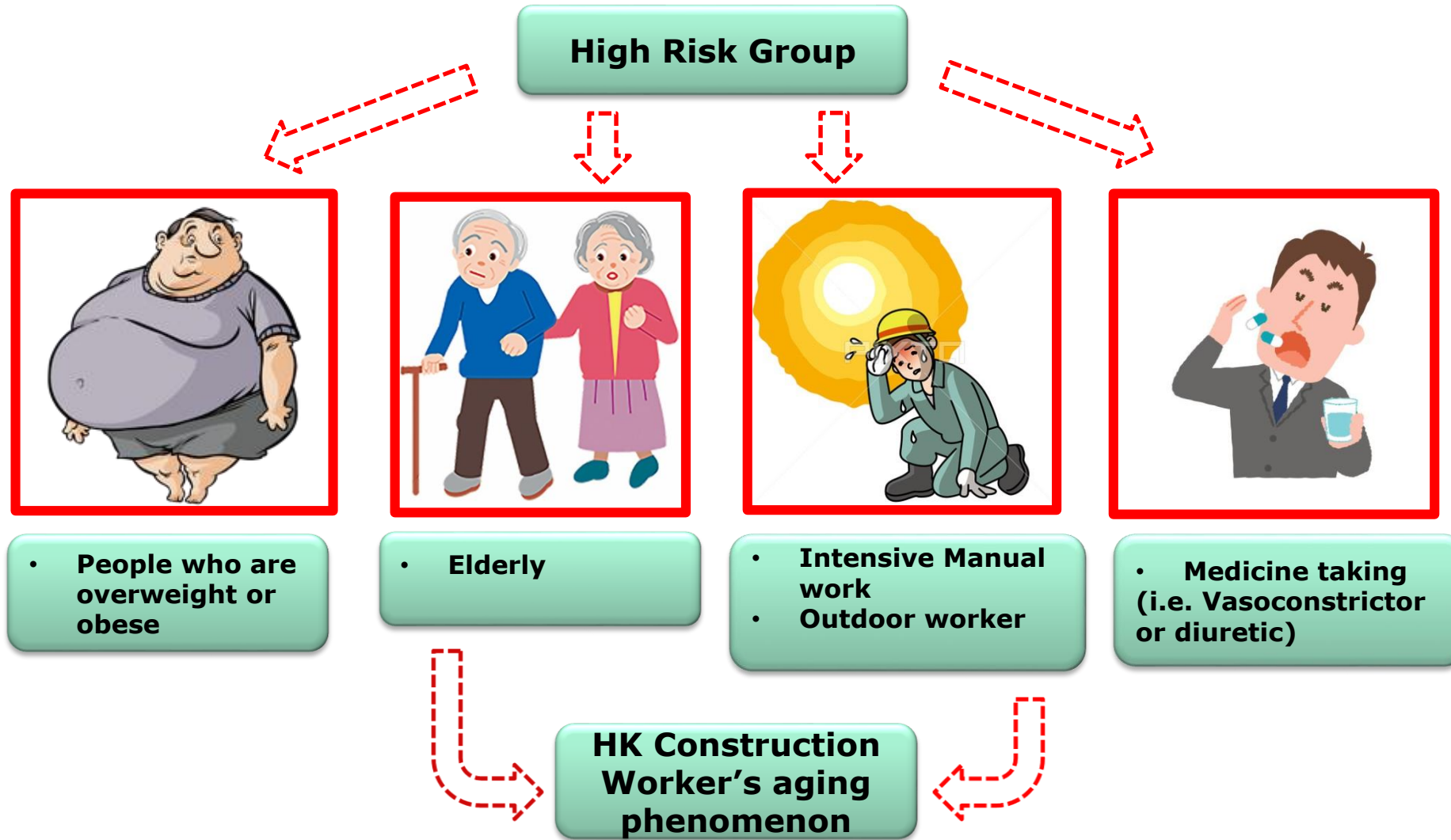
Others



Mainly:

- Indoor works
- Paper works

3) Heat Exhaustion & Heat Stroke



4) Heat Exhaustion & Heat Stroke



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KNOW THE SYMPTOMS



Heat Exhaustion



Heat Stroke

VS

Time to Know the Difference

Faint or dizzy		Throbbing headache
Excessive sweating		No sweating
Cool, clammy skin		Red, hot, dry skin
Nausea or vomiting		Nausea or vomiting
Rapid, weak pulse		Rapid, strong pulse
Muscle cramps		May lose consciousness

5) Understand Yourself More

1. Induction Training Worker's Blood Pressure Monitoring



世界衛生組織界定高血壓範圍

年齡	上壓(mmHg) 收縮壓	下壓(mmHg) 舒張壓
45歲以下	<145	
45至59歲	<150	<90
60歲以上	<155	<95
		<100

中電現場電腦監測項目



2. Health Checking program



Workers' Uniform & Heat Stroke Kit



**"Dry - fit"
site uniform**

**Arm
protector**



**UV
protection
sun glass**

**Sun
shade**

**UV
protection
sun glass**

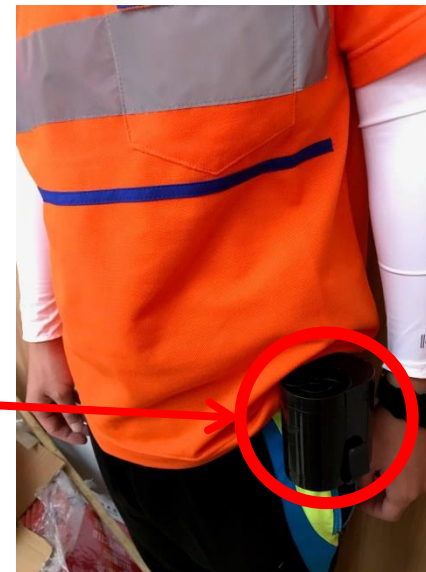


**Sun
shade**

**Arm
protector**



**Waist-
hanged
Fan**



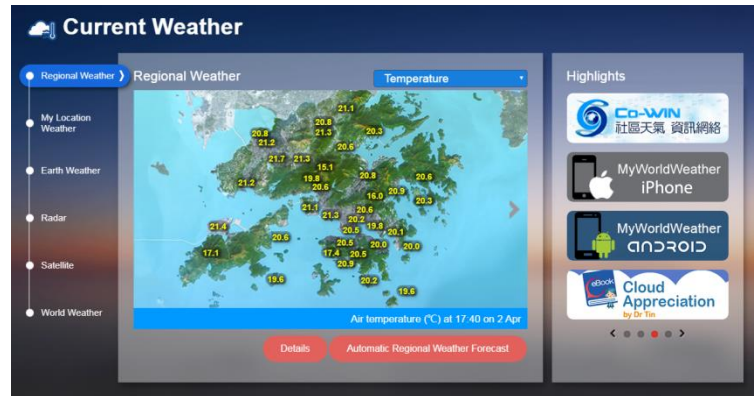
**Cool air
trapped**

6) Ways to Tackle

Information Collection

Traditional way:

Data form Hong Kong Observatory



Innovative way:

Set up an on site weather station to collect local data actively



6) Ways to Tackle



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Data Analyze & Manipulation

中暑指數表

相對濕度(%) 溫度 (°C)	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%
21 °C	29	29	28	27	27	26	26	24	24	23	23	22				
22 °C	31	29	29	28	28	27	26	26	24	24	23	23				
23 °C	33	32	32	31	30	29	28	27	27	26	25	24	23			
24 °C	35	34	33	33	32	31	30	29	28	28	27	26	26	25		
25 °C	37	36	35	34	33	33	32	31	30	29	28	27	27	26		
26 °C	39	38	37	36	35	34	33	32	31	31	29	28	28	27		
27 °C	41	40	39	38	37	36	35	34	33	32	31	30	29	28	28	
28 °C	43	42	41	41	39	38	37	36	35	34	33	32	31	29	28	
29 °C	45	45	44	43	42	41	39	38	37	36	34	33	32	31	30	
30 °C	48	47	46	44	43	42	41	40	38	37	36	35	34	33	31	31
31 °C	50	49	48	46	45	44	43	41	40	39	38	36	35	34	33	31
32 °C	52	51	50	48	47	46	45	43	42	41	39	38	37	36	34	33
33 °C	55	54	53	51	50	48	47	46	44	43	42	40	38	37	36	34
34 °C	58	57	55	53	52	51	49	48	47	45	43	42	41	39	37	36
35 °C		58	57	56	54	52	51	49	48	47	45	43	42	41	38	37
36 °C			59	57	56	54	53	51	50	48	47	45	43	42	40	38
37 °C					58	57	55	53	51	50	49	47	45	43	42	40
38 °C							57	56	54	52	51	49	47	46	43	42
39 °C									56	54	53	51	49	47	45	43
40 °C										55	54	52	51	49	47	44
41 °C											54	53	50	48	46	44
42 °C												53	51	50	48	46
43 °C													52	51	49	47

Based on the collected data:

1. Determine the stage of heat level
2. Corresponding Control Measure Level (Level 1,2,3)

表格 1：中暑指數表註解

中暑指數表	顏色	舒適程度	採取措施
20 - 29	綠	沒有不舒適	
30 - 39	黃	有些不舒適	階段 1
40 - 45	橙	十分不舒適，避免劇烈工作	階段 2
46 或以上	紅	危險！中暑機會極高	階段 3

例：氣溫 33 °C，相對濕度 90%。中暑指數為 52，中暑機會極高

Heat Stress Matrix

6) Ways to Tackle

Corresponding Control Measure Level (Level 1,2,3)

階段 1	
1. 提供足夠清涼飲用水，設置飲水處於地盤寫字樓、休息間、流動消暑亭、讓工友隨時飲用	2. 設置避暑亭、太陽傘等設施，以阻擋陽光直照，減少空氣流動
	
3. 設置沖涼房和洗手處	
	
4. 提醒工友多飲水，以補充身體流失的水份	5. 提醒工友避免飲用含如：咖啡、茶
	
6. 嚴禁工友飲用酒精飲料	7. 每工作 2 小時應安排
	
8. 確保員工有足夠的訓練，認識中暑的徵狀、預防措施及急救方法	

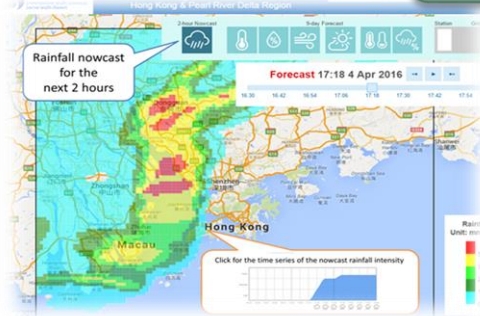
階段 2	
1. 在工作地點架設臨時上蓋以遮擋陽光，如流動遮陰架，以避	
	
2. 提供電解質飲品，例如：Oral Rehydration Salt	3. 休息時間會
	
	上午 8 時 - 上午 9 時 45 分 上午 9 時 45 分 - 上午 10 時 15 分 上午 10 時 15 分 - 正午 12 時 正午 12 時 - 下午 1 時 下午 1 時 - 下午 2 時 15 分 下午 2 時 15 分 - 下午 2 時 30 分 下午 2 時 30 分 - 下午 3 時 45 分 下午 3 時 45 分 - 下午 4 時 - 下午 4 時 - 下午 4 時
4. 提醒工友避免飲用含咖啡因的飲品，例如：咖啡、茶	5. 嚴禁工友飲用酒精飲料
	
7. 安排較輕鬆的工作或較短的工作時間給新進場員工，以幫助他們適應酷熱的工作環境	8. 減少劇烈體力處理工作，例如使用輔助機械

階段 3	
1. 向工友講解中暑的徵狀、預防措施及急救方法	2. 嚴禁工友飲用酒精飲料
	
3. 提供清涼降溫的用品(如：凍巾)，令工友感覺涼快	4. 提醒工友避免飲用含咖啡因的飲品，例如：咖啡、茶
	
5. 鼓勵工友定時飲水或電解質飲品，以補充身體流失的水份和電解質	6. 重新安排工作，例如安排上午較早前及下午較晚後進行
	
7. 每工作 1 小時應安排 15 分鐘小休	8. 減少劇烈體力工作，例如使用輔助機械及經常轉換工作崗位，避免中暑
9. 隔離工作地點的高溫設備(如：發電機)，減少熱能散發到工作間，影響員工	10. 禁止進行熱工序之工作，以免工友穿著圍裙及皮手套，增加中暑機會

6) Ways to Tackle

1

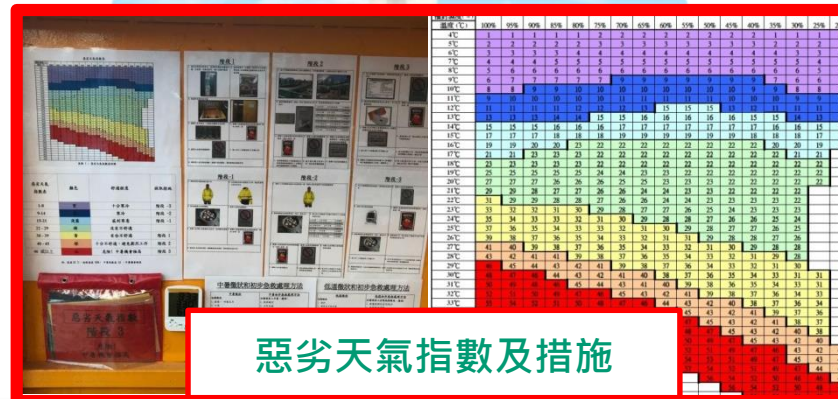
On Site Facilities Support (防暑八寶)



Passively rely on information
from HK Observatory



Active Collection of Local Data



1. Improve the accuracy of information as data are collected locally
2. Enhance the project team on site management & work schedule
3. Improve the emergency responsiveness against the adverse weather condition

E.g Prepare water pump before heavy rainfall / re-schedule outdoor works like arc-welding if rainy days are forecasted

On Site Facilities Support (防暑八寶)



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UV protection
sun glass

2

Sun
shade

Arm protector
UPF 50+



3



4



5



⑥

Thermometer



Automatic Water Spray System



Electric signal
controller



Sprinkler head



Electric valve receive signal
from Electric signal controller



Safe Access

On Site Facilities Support (防暑八寶)



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7



8



Example of combination with other construction emergency service



AED & First-aid box



Stretcher



Drinking Water Supply



Storage of Water



Multi-function Station



Lightning Protection



Toilet



Rest Area



Cooling Fan

6) Ways to Tackle

Notification to frontline worker



Physical Display



Electronic Notification

7) Sustainable Improvement

WeCare Program

1. Comment from Worker



2. Top Management Lunch box meeting



Worker with great idea to enhance the site safety performance will be nominated as Safety Hero with cash award.

Idea



Practical



I suggested that the Water Spray System can be automatic associate with the local weather station to determine the On/Off section.

8) Site Practice & Promotion



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Summer Promotion

寶礦力水特
POCARI
SWEAT

POCARI SWEAT is a health oriented drink which supplies water and electrolytes lost through perspiration. POCARI SWEAT is quickly absorbed into the body tissues due to its fine granularity and contains electrolytes for replenishing body fluids. POCARI SWEAT is thus highly recommended as a beverage for such activities as sports, physical labor, after a hot bath, and even on an eye-opener in the morning.

「寶礦力水特」是一種補充人體因流汗而遺失的水分及電解質之飲品。由於「寶礦力水特」之微粒極細，能迅速被人體組織吸收，能迅速補充人體電解質，因此特別適合運動、體力勞動、工作、沐浴及起床後飲用。

Directions:
Each pouch (net weight 15g) makes 100ml. Pour the powder into cold water, stir until completely dissolved.

Directions (Chinese):
將每包 (淨重15克) 之粉倒入冷水中，攪拌至完全溶解。

Net weight (g) 15g (For 200ml, serving)
淨重 (克) 15 (供200ml, 份量)

Electrolyte Powder



Safety Helmet Neck Shade



Arm protector
(UPF 50+)



Water Bottles

8) Site Practice & Promotion



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Fruit Party for Summer

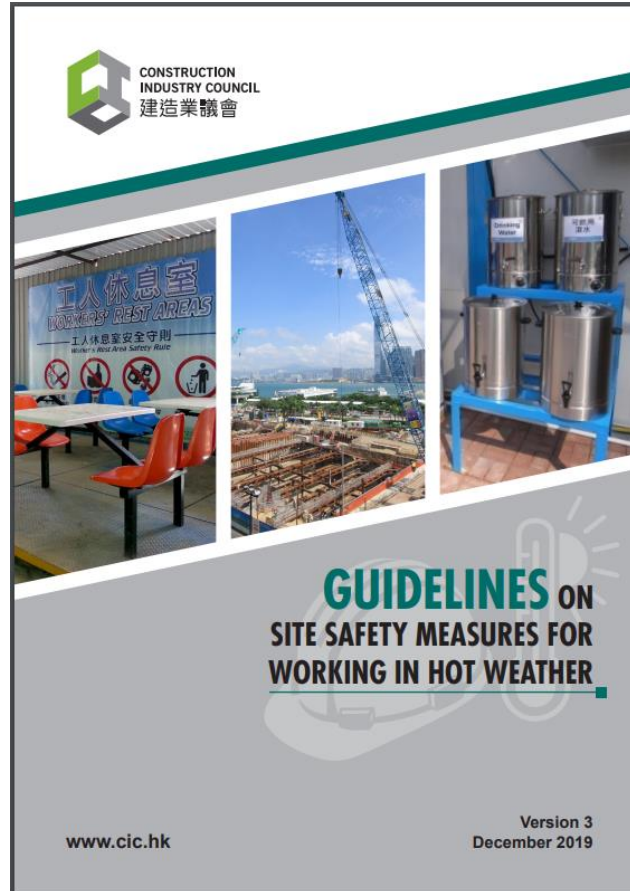
- Fruit has high water content that will keep your body hydrated and refreshed.
- Presence of Lycopene in the fruit protects your skin against sun damage.
- Watermelon also decreases the risk of obesity, heart disease, diabetes and many more.



8) Site Practice & Promotion

**Let get back to our childhood
!! Ice-Cream for the Summer!!**





New element on version 3 guidance

1. Pair of sun protection arm sleeves with **Ultraviolet Protection Factor of at least 50** is recommended to be provided for worker.
(Section 5.5.2)
2. More detail PPE description regarding sun protection
(i.e. **Neck shades & safety helmet**)
(Section 5.5.3)

**GUIDELINES ON SITE SAFETY MEASURES FOR
WORKING IN HOT WEATHER**
Version 3 published on Dec 2019



承擔.團結 成就專業