

# Standard Operating Procedure for Handling a Chemical Spill

DOUCMENT PARTICULARS	
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	Prof. Pan Guangjin
	Director of CRMH

## **Review History**

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01				New SOP

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#### A) Objectives

This document describes the procedures used by Centre for Regenerative Medicine and Health, Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences Limited (refer to CRMH below), staff and students who work in cleanroom and open laboratory to respond to chemical spills so as to contain and control the spill and minimize the exposure.

#### B) Scope

This document applies to all students and staff in CRMH. Students and staff in CRMH are responsible for knowing which chemicals are used for their experiments and located in their laboratory, as well as being familiar with the hazards posed by these materials.

#### C) Facility Covered

Cleanrooms, open laboratories, and fume hoods in CRMH, 5/F, 15 Science Park West Avenue, Hong Kong Science Park, Shatin, Hong Kong

#### D) Basic rules for working in the laboratory

- 1. Never eat, drink, smoke, or use make-up in the laboratories.
- 2. Never leave any ongoing experiments unattended.
- 3. Long hair and loose clothing should be properly confined.
- Wear proper personal protective equipment e.g., gloves, laboratory gown, goggles, hearing protection, and eye protection whenever applicable.
- 5. Shorts, sandals, and slippers are not allowed in the laboratories.
- 6. Know the laboratory's emergency escape routes and evacuation procedures.
- 7. Know the locations for the laboratory's safety equipment, including safety station, firefighting equipment, emergency shower and eyewash unit, spill kit, first-aid kit, etc
- 8. Know the emergency phone numbers to call for help in case of an emergency.
- 9. Read the MSDS and understand the potential hazard of the chemicals before using.

#### E) Personal Protective Equipment (PPE)

To handle spills, the following PPE must be worn.



- The purpose for personal protective equipment (PPE) is to shield the individual in the event of a release of vapor, a spill or other incident. PPE is NOT a substitute for safe work practices.
- Eye protection must be used during handling and clean-up of any chemical spill.
   Safety goggles are required and are available inside Spill&Go kit on Safety Station shelf located at each open lab.
- Nitrile/Latex gloves or other chemical-resistant gloves should be worn. Chemical burns can be extremely painful and difficult to treat.
- Lab coat must be worn when you handle the spill. If the lab coat is spilled with chemical(s), it should be washed after cleaning the spill.
- Wear the respirator when you handle the minor spill of corrosive chemical, toxic chemical, or any chemical which vapor may damage your respiratory tract.

#### F) Chemical Spill Kit

Spill&Go spill kit is placed at Safety Station in open laboratory (Appendix E).



The Spill&Go kit can be applied to spillage of acids, alkalis, organic solvents, and oil. It includes the following components:

- Safety goggles
- 2. Respirators and filters
- 3. Nitrile gloves
- 4. Absorbent materials (boom and pads)
- 5. Plastic bag and tether for waste materials

#### **G)** Warning

No spills or wastes should be flushed down a drain except where it is clearly known that it is permissible and no harm to plumbing or to the environment will result. Always refer to Material Safety Data Sheet (MSDS) of spilled chemical(s) before taking any action against the spill.

#### H) Minor and Major Chemical Spill Classification

Minor, indoor spills that present no immediate, significant threat to personal health or safety, or of being released to the environment, are to be cleaned up by the person(s) responsible for the spill. Minor Spill is one in which **ALL** of the following conditions are met:

- the responsible party is at the scene; and
- the material spilled is known; and
- the material spilled is NOT highly toxic according to MSDS; and
- the quantity spilled is small (<4 L); and</li>
- there is NO fire hazard present according to MSDS; and
- the spill is completely contained inside a building; and the material has little or no potential to reach the environment (e.g., via a drain); and
- the spill is NOT in a common area (e.g., a hallway) or other area accessible to the general public; and
- medical attention is NOT required; and
- advanced PPE (i.e., more than gloves and a half-face respirator) is NOT needed to respond to the spill; and
- on-site personnel are trained, equipped, and able to clean up spill

Major Spill is one in which **ANY** of the following conditions apply:

- the responsible party is unknown (it's an "orphan" spill); or
- the material spilled is unknown; or
- the material spilled is highly toxic, volatile, or flammable according to MSDS; or
- a large (or undetermined) quantity was spilled; or

- a significant fire hazard may be present according to MSDS; or
- someone has been exposed to/made contact with the material; or
- the material has the potential to reach the environment (e.g., via a drain); or
- the spill is in or affects a common area (e.g., the lift lobby) or other area accessible to the public; or
- advanced PPE (more than gloves and a half-face respirator) is required to respond to the spill; or
- someone reports to Medical or requires first aid; or
- on-site personnel are NOT trained or NOT equipped to clean up spill; or
- a responder is unsure whether the spill should be considered "Minor" or "Major".

#### I) Procedures

#### 1. <u>General Procedures</u>

- 1.1. Put on appropriate PPE (Section E) before approaching the spill.
- 1.2. Before taking action against the spillage, the handler shall know the details of the spillage content as much as possible and refer to the chemical's MSDS for proper precaution and action.

#### 2. Minor Spill (see Section J for definition)

- 2.1. Minor Spill in Open Laboratory or Cleanroom (OUTSIDE fume hood)
- 2.1.1. Alert people near the site of spillage and prevent people from entering the spillage area.
- 2.1.2. Remove ignition sources (e.g., open flame, hot plate)
- 2.1.3. Refer to the chemical's MSDS for its hazard and the potential risk on handling the spill.
- 2.1.4. For safety reason, **at least 2 people** should work together when dealing with a spillage incident.
- 2.1.5. For volatile chemical spillage above its potentially harmful amount, say 500 mL, please treat this spillage as the major spill and follow the procedures in Section I3.
- 2.1.6. Bring the Spill&Go Kit to the spill location if you feel comfortable to handle the spill.
- 2.1.7. Make sure to put on appropriate PPE (see **Section E**) before approaching the incident area. If the chemical is toxic or could cause irritation by inhalation, a respirator fitted with appropriate filter should be used.
- 2.1.8. Dike or surround the outside of the spill with absorbent booms.
- 2.1.9. Put adequate absorbent pads on the spill from the periphery inwards and allow at least 5-minute absorption.
- 2.1.10. Alert your lab manager and F&OC staff verbally if the situation allows, and

- provide the details of the spilled content for proper action and caution.
- 2.1.11. Carefully transfer the used booms and pads into a plastic waste bag with metallic tongs.
- 2.1.12. Leave the waste bag open and vent inside a fume hood for 24 hours before tightening it with a tether.
- 2.1.13. Check and follow "Methods for Cleaning Up" in MSDS of the spilled chemical for complete clean up.
- 2.1.14. Report the spillage incidence according to Section I4. F&OC staff will arrange the disposal of the waste bag.

#### 2.2. Minor Spill INSIDE Fume Hood

- 2.2.1. Stop all sources of ignition.
- 2.2.2. Close sash and place a sign indicating "DO NOT OPEN: Spill Inside".
- 2.2.3. Refer to the chemical's MSDS for its hazard and the potential risk on handling the spill.
- 2.2.4. Alert your lab manager and F&OC staff verbally if the situation allows, and provide the details of the spilled content for proper action and caution.

#### If the spill is a:

#### 2.2.5. Volatile chemical

- 2.2.5.1. Allow the volatile spill to vent.
- 2.2.5.2. Wait until the visible spill has evaporated
- 2.2.5.3. Open sash to working height and clean fume hood surface with reference to "Methods for Cleaning Up" in MSDS of the spilled chemical for complete clean up.
- 2.2.5.4. Remove sign in Step 2.2.2.

#### 2.2.6. Corrosive chemical

- 2.2.6.1. Bring Spill&Go kit near the fume hood.
- 2.2.6.2. Put on chemical resistance gloves.
- 2.2.6.3. Retrieve necessary absorbent materials and a disposal bag from the kit.
- 2.2.6.4. Open sash to proper working height and place absorbent materials on the spill from the periphery inwards to absorb the spill.
- 2.2.6.5. Place all soaked absorbents into the disposal bag.
- 2.2.6.6. Let the bag vent in fume hood for 24 hours.
- 2.2.6.7. Report the spillage incidence according to Section I5.
- 2.2.6.8. Next day, tighten the bag with a tether and dispose it under the recommendation from F&OC.

- 2.2.6.9. Open sash to working height and clean fume hood surface with reference to "Methods for Cleaning Up" in MSDS of the spilled chemical for complete clean up.
- 2.2.6.10. Remove the sign in Step 2.2.2.

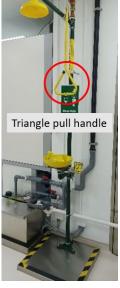
#### 3. Major Spill (see Section J for definition)

- 3.1. Evacuate the incident area. Make sure nobody stays behind. Close the door(s) of the laboratory after the last person has left.
- 3.2. Put a signage "DO NOT ENTER: Chemical Spill" at Open Lab entrances to prevent unauthorized personnel from entering the incident area; and provide the contact no. of your team's lab manager and F&OC lab manager on the signage.
- 3.3. If there is a risk to the remainder of the building, press the Emergency Call Button to inform Hong Kong Science and Technologies Parks Corporation (HKSTP) staff and press the Emergency Ventilation Button to ventilate the laboratory. (Refer to Appendix C for the locations of Emergency Call Buttons and Emergency Ventilation Buttons.)
- 3.4. Dial 999 to report for immediate help.
- 3.5. Report the spillage incidence immediately to your supervisor, the lab manager of your research team, and F&OC staff for help and advice.
- 3.6. Wait in a safe area for the response team of HKSTP or the Hong Kong Fire Service Department. Stay calm and try to recall the incident's details, as your knowledge of the area will assist their decision-making.

#### 4. Personal Exposure

- 4.1 Chemical Spill on Body
  - 4.1.1. Wash thoroughly with water using the nearest emergency shower unit for at least 15 minutes (Refer Appendix D for the locations of emergency shower).
    - 4.1.1.1. Activate the shower by pulling the triangle pull handle. The water discharge can be discontinued by pushing up the pull handle to the off position.
    - 4.1.1.2. Activate the eyewash by pushing the push handle back 90°. The unit will operate unit the push handle is manually pull back up to the off position. The eyes should be kept open by the finger





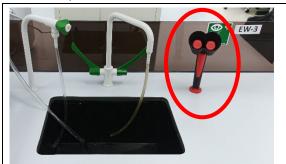
while they are in the water stream.

- 4.1.2. Remove any overlying clothing that may retain the chemical or may prevent washing of affected skin.
- 4.1.3. Depending on the chemical, additional medical treatment may be required.

  Consult related MSDS and/or specific laboratory procedures.
- 4.1.4. Contain water flow from showers with absorbent material to prevent the spread of contamination.
- 4.1.5. Immediately inform the incidence to your supervisor, lab manager, and F&OC staff for follow up.

#### 4.2 Chemical Spill in Eye

4.2.1. Immediately go to the nearby bench's basin and pull the eye washer on the basin's right-hand side (Refer Appendix D for the location of emergency eye wash).



An eye washer next to each lab water basin



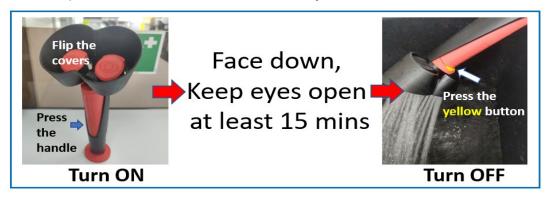
An eye washer included in each emergency shower unit.



An Eyewash Kit is available in each Safety Station.

- 4.2.2. Flip the cover of mini-shower head before pressing the red bar beneath the handle for running water.
- 4.2.3. Rinse the victim's eyes at least 15 minutes with his/ her face down above the sink. (For corrosive materials, you may need to flush for up to 60 minutes –

- review the MSDS). Removing contact lenses if possible. The eyes should be kept open by the finger while they are in the water stream.
- 4.2.4. When finished washing, stop the running water by pressing the yellow button on the top side of the red bar beneath the Eye Washer's handle.



- 4.2.5. Flip down the covers of the mini-shower head and put the eye wash back to its original position.
- 4.2.6. If the person cannot go to the lab water basin, co-worker nearby should help him/her to get the Eyewash Kit from the Safety Station.
- 4.2.7. If discomfort persists, seek medical treatment from the hospital emergency department. If possible, bring along the MSDS to the physician for proper treatment.
- 4.2.8. Immediately inform your supervisor, the lab manager of your research team, and F&OC staff about the spillage incident.

#### 5. Reporting Procedures after the Clearance of the Spillage

- 5.1 After an accident or incident, you (either the injured in an accident or the witness of an incident) are required to provide a written report within 48 hours of accident/ incident to F&OC team. CRMH Minor Incident Report for Internal Record is mainly for minor accidents /incidents (Appendix A), while HKSTP Accident & Incident Report Form (Appendix B) is mainly for major accidents/ incidents.
- 5.2 F&OC staff shall assist you to complete the report and send it to your supervisor and lab manager of your research team. For major chemical spill, the *HKSTP Accident/ Incident Report Form* will also be sent to the Director and Deputy Director of the Centre and SHE Office of HKSTP by email she\_office@hkstp.org within 72 hours of major accident or incident.
- 5.3 In addition to the reporting of major accidents or incidents to HKSTP by completion of the *HKSTP Accident & Incident Report Form* (**Appendix B**), F&OC is required to inform the Labour Department of any serious accidents in accordance with local legislations, i.e. the Occupational Safety and Health Ordinance (Cap. 509) and Employees' Compensation Ordinance (Cap. 282).

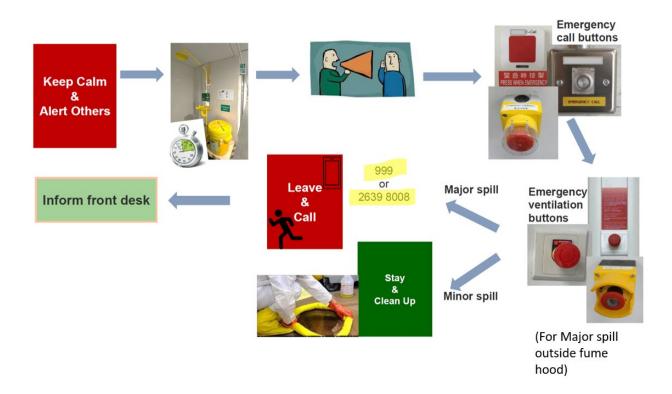
5.4 Details of the HKSTP Accident and Incident Reporting Procedures can be referred to the Section B02 of the HKSTP SHE Handbook (Part II)- Laboratory & Research Safety Requirements.

#### J) Contact numbers

For life threatening situations, call the local emergency hotline at **999** for urgent help. For other situations, call the following parties for assistance.

- Laboratory manager and the first aider of the corresponding research team
- F&OC Department: 2621 0608/ 2621 0676
- HKSTP 24-hour Customer Services Hotline: 2639 8008

#### K) Flow Diagram for Handling Chemical Spill



#### L) Abbreviations

CRMH Centre for Regenerative Medicine and Health, Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences Limited

F&OC Facility ad Operation Compliance Department

HKSTP Hong Kong Science and Technology Parks Corporation

HKSTP Hong Kong Science and Technology Parks Corporation

MSDS Material Safety Data Sheet
PPE Personal Protective Equipment

SHE Office Safety, Health, and Environment Office

CRMH-SOP-009-V1 (SOP for Handling a Chemical Spill) Effective Date:

#### Appendix A: CRMH Minor Accident & Incident Report for Internal Record

Reference No. \_\_\_\_\_



#### Centre for Regenerative Medicine and Health, HKISI, CAS Minor Accident & Incident Report



(for Internal Record)

Note: This report form is designed for a minor laboratory injury/accident/near-miss/chemical or biohazardous spill, it should be completed and sent to the Facility and Operation Compliance (F&OC) Department within 48 hours of the accident or incident.

Name of involved staff (full name):	
Research Team:	RP1 / RP2/ RP3 (cross out inappropriate choice)
Contact information of involved staff:	Tel:
	Email:
Location of the incident:	
Date (DD/MM/YY) & Time of the incident:	
Brief Description of Accident / Incident; Cause of Accident	t / Incident; What actions have been taken?
List any showingle or high gird material involved.	
List any chemicals or biological material involved:	
List any equipment involved:	
List any equipment involved.	
List of PPE that the victim was wearing:	
else of the directive victim was wearing.	
Name of witness (full name):	
,	
Was first aid administered? If yes, who administered the	
first aid and what was done	
Was the victim taken to clinic/ hospital?	
Recommendation for Prevention of Recurrence	
Accident / Incident Reported By	
Name:	Signature:
Post Title:	Date:
Accident / Incident Report Endorsed By	
•	
Name:	Signature:
	Signature:
Post Title:	Date:

Minor Accident & Incident Report \_Ver 1.0 (1 Apr 2023)

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Reference No.

Appendices (if any)			
Incident Location/ Photo/ Sketches	Description		

#### Appendix B: HKSTP Accident & Incident Report Form



## Safety, Health and Environment Office Accident & Incident Report Form

SHE Form L02/S02 (Official use only) Reference No.:

Note: This report form should be completed and sent to the Safety, Health & Environment (SHE) Office of HKSTP within 72 hours of the accident or incident. The information provided herein will be used for investigation and compiling accident statistics.

In case of work-related accident to employee resulting in death or partial incapacity, the concerned unit of HKSTP or the client should fill in the relevant form provided by the Labor Department of Hong Kong and return it in duplicate to the Commissioner for Labor within the statutory required period.

ret	return it in duplicate to the Commissioner for Labor within the statutory required period.						
1.	1. Accident / Incident Information						
Da	Date: Time: Location:						
Ту	Type of Area:						
	Office	□ La	boratory/	☐ Other	rs ( <i>P</i>	Please specify):	
		W	orkshop/	. —			
2.	Nature of Accident /	Incide	ent				
	Fire / Explosion		Spillage of ha	zardous		Exposure to or contact with	
			substances			harmful substance	
	Unpleasant smell		Damage to pr	operty /		Slip, trip or fall on same level	
			equipment				
	Fall of person from		Injured whilst	lifting or		Trapped in or between objects	
	height		carrying				
	Stepping on object		Striking again	Striking against fixed or		Striking against moving object	
			stationery object				
	Trapped by collapsing		Struck by moving or falling			Struck by moving vehicle	
	or overturning object		object				
	Contact with moving		Contact with	_		Traffic accident	
	machinery or object		electric discharge				
	being machine						
	Flooding		Drowning			Others (Please specify):	
3.	Personal Details (For	the in	jured or person	concerned)			
Na	me:			Sex:		☐ Male ☐ Female	
Po	st Title:			Phone No	o.:		
Di	Division / Company Name:						
Co	Company Address:						
Na	ture of Injury:						
	Abrasion		Dislocation			Irritation	
	Amputation		Electric shock			Laceration and cut	
	Asphyxia		Fractures			Nausea	
	Burn		Freezing			Poisoning	

Accident & Incident Report Form \_Ver 2.0 (2021 10)

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## Safety, Health and Environment Office

## Accident & Incident Report Form

(Official use only)
Reference No.:

	Chemical Reaction Contusion & Bruise Crushing	<ul> <li>□ Hearing disturbation</li> <li>□ Infection due to inadequate med</li> <li>□ Dislocation</li> </ul>	delaye	d∕ □ Sprain	re wound & strain (Please specify):
Pa	rt of Body Injured:				
He		Neck & Trunk	Uppe	er Limbs	Lower Limbs
	Skull	□ Neck		inger	☐ Hip
	Eye	□ Back		land/palm	□ Thigh
	Ear	□ Chest		orearm	☐ Knee
	Mouth/ tooth	□ Abdomen	□ E	lbow	□ Leg
	Nose	□ Trunk	□ U	Jpper arm	□ Ankle
	Face	☐ Pelvis/groin		houlder	□ Foot
	Multiple location (Ple	ease specify):			
_					
Th	e injured received me	dical treatment:	□ Y	es	□ No
Th	e injured was hospital	lized:	□ Y	'es	□ No
Th	e injured took sick lea	ive:	□ Y	es (No. of	□ No
			d	ays:	_)
4.	Brief Description of A	Accident / Incident (Ple	ase prov	vide sunnlement	ary information in
	appendices if any)	The state of the s			a.,, ca
$\vdash$					

Accident & Incident Report Form \_Ver 2.0 (2021 10)



## Safety, Health and Environment Office Accident & Incident Report Form

SHE Form L02/S02
(Official use only)
Reference No.:

_								
5.	Agent Involved (if an	y)						
	Equipment for		Material/ pro	duct		Movable container		Electricity supply,
	lifting/ conveying		being handled	d or		or package of any		wiring apparatus
			stored			kind		or equipment
	Portable power or		Ladder or wo	rking		Floor, ground,		Vehicle or
	hand tools		at height			stairs or any		associated
						working surface		equipment or
								machinery
	Other machinery,		Sewage, man	hole		Gas, vapour, dust		Others (please
	(please specify)		or other confi	ined		or fume		specify)
			space					
6.	Cause of Accident / I	ncid	ent					
7.	Recommendation fo	r Pre	vention of Rec	urren	ce			
8.	Accident / Incident R	Repo	rted By					
Na	Name: Signature:							
Po	Post Title: Date:							
9.	Accident / Incident F	Repo	rt Endorsed By					
Na	me:			Signa	tur	e:		
Ро	st Title:			Date	:			



## Safety, Health and Environment Office Accident & Incident Report Form

SHE Form L02/502 (Official use only) Reference No.:

Incident Location/ Photo/ Sketches  Description	Appendices (if any)			
	Incident Location/ Photo/ Sketches	Description		



## Safety, Health and Environment Office Accident & Incident Report Form

SHE Form L02/S02
(Official use only)
Reference No.:

For Internal Use by SHE Office of HKSTP	
Further investigation required:	□ No
Accident & Incident Report No.:	
(The Report no. shall refer to corresponding reference number generated from Accident & Incident Log Record)	
Accident / Incident Classification Code:	
(if applicable)	
Accident / Incident Cause Code:	
(if applicable)	
Remark:	

## Appendix C: Locations of Emergency Call Buttons and Emergency Ventilation Buttons in CRMH

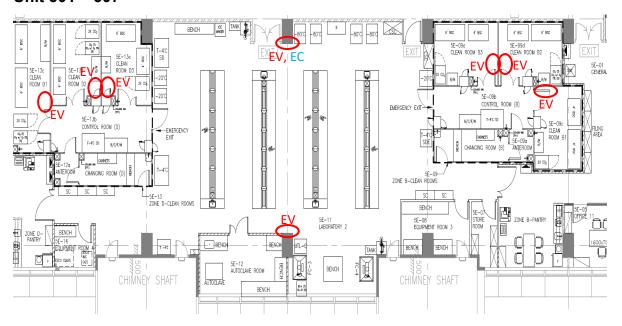




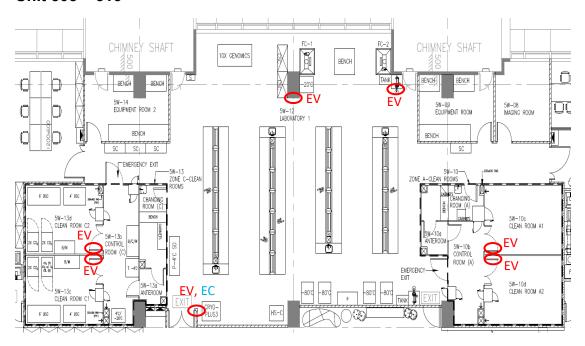


EV: Emergency Ventilation Button

#### Unit 501 - 507



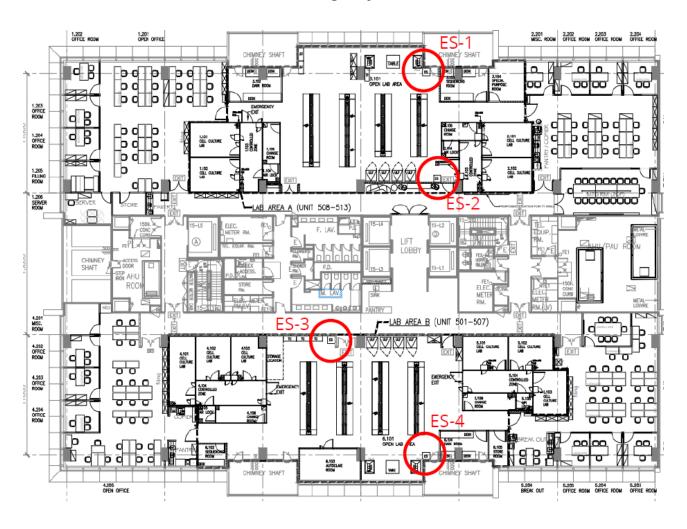
#### Unit 508 - 513



Appendix D: Locations of Emergency Showers and Eye Wash in CRMH

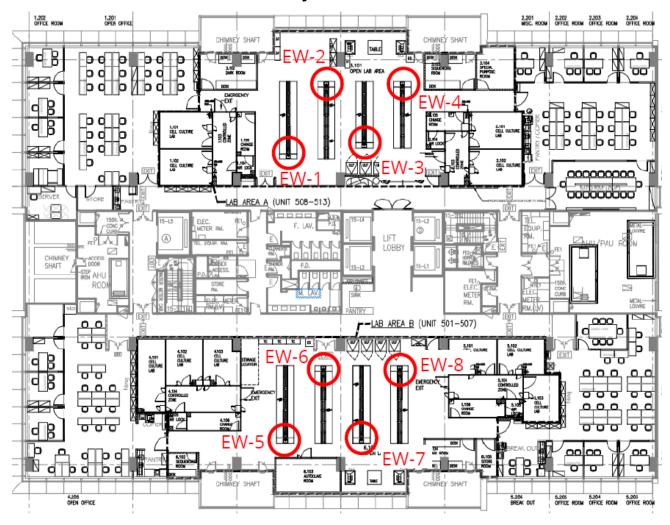


**ES- Emergency Shower** 



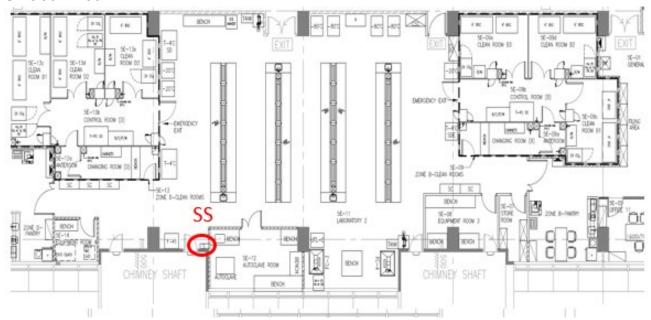


**EW- Eyewash Station** 



### Appendix E: Location of the Safety Station

#### Unit 501 - 507



#### Unit 508-513

