

# WSH (Asbestos) Regulations & Guidelines on Management and Removal of Asbestos

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MINISTRY OF  
MANPOWER

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A Great Workforce A Great Workplace

# Background – Asbestos and its health effects

## What is Asbestos?

- Naturally occurring fibrous minerals
- Excellent insulation materials
- Corrosion and chemical resistant

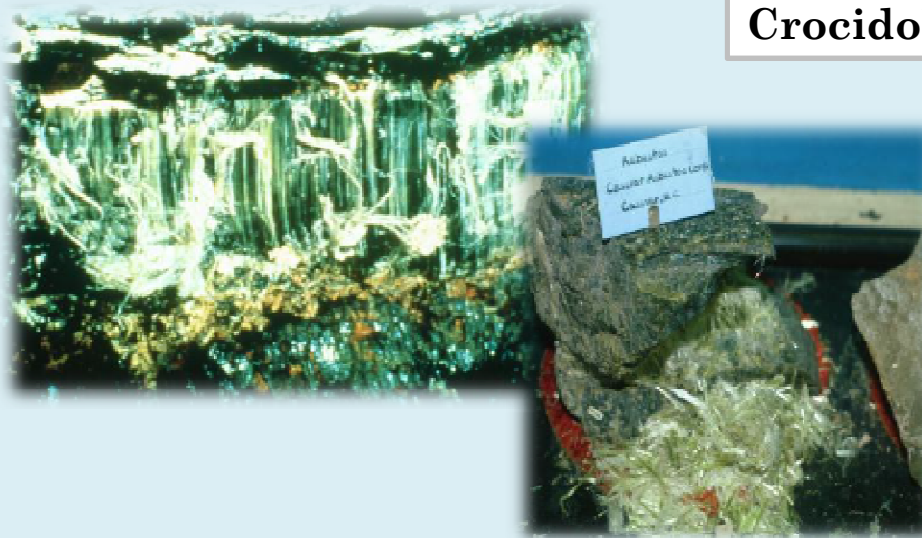
3 main types of asbestos

Chrysotile (White)



Crocidolite (Blue)

Amosite (Brown)



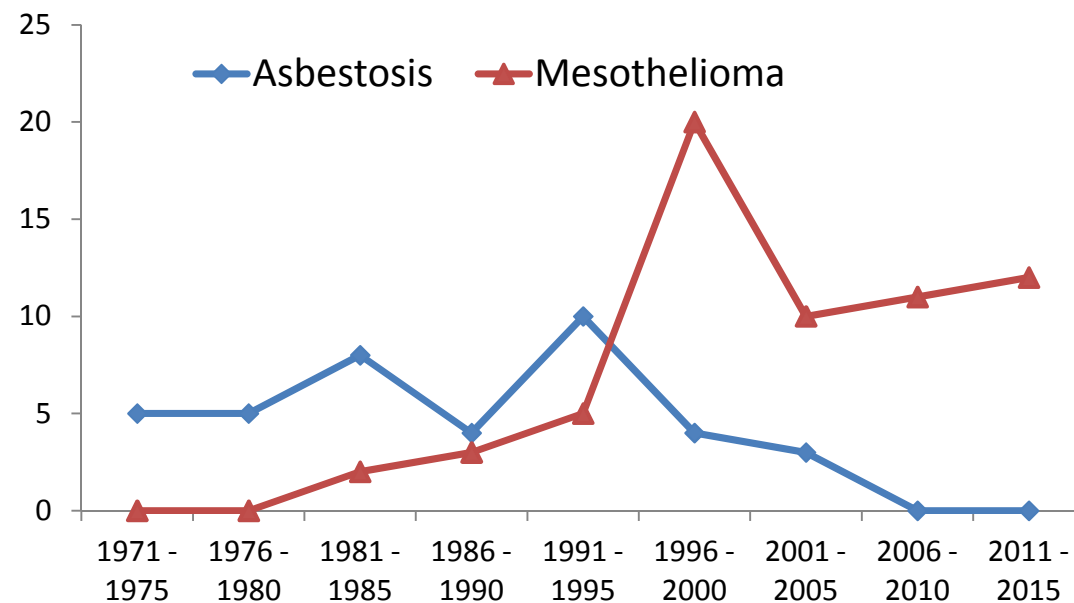
## Background – Asbestos and its health effects

- Asbestos is a confirmed human carcinogen
- Exposure to asbestos can cause mesothelioma, asbestosis and lung cancer
- Long latency period (typically 15- 30 yrs)



## Background – Statistics of Asbestos-Related Diseases

### Work-related Asbestos Related Diseases in Singapore



Up till 2013,

**39** cases of Asbestosis & **63** cases of Mesothelioma.



# Background – History of Asbestos Control in Singapore



Wide usage of asbestos as building materials, fireproofing and heat insulators



Enactment of Factories (Asbestos) Regulations in 1980

Licensing of all raw asbestos and ACM (excluding chrysotile) imports in 1989



Inclusion of chrysotile containing ACM for licensing control in 2008



Banning of asbestos brake pads and clutch linings in 1995



Use of asbestos building materials banned in 1988



Decreasing use of ACM



# Asbestos Removal is High Risk Work



**Demolition**



**Renovation**



**Removal of  
asbestos**



**Waste Handling  
& Disposal**

- Asbestos fibres can be released from broken ACM during demolition , renovation or removal and disposal work which is not properly carried out.
- Workers, bystanders, future occupants and public can be exposed

**Need to enhance regulatory framework to include specific provisions for asbestos removal work**



# Improper Removal of Asbestos - Risk of Exposure



**Asbestos-  
contaminated  
sites**



# Asbestos Ops (demolition of building built before 1990)

## Summary of findings...

11 out of 36 sites assessed contain asbestos (approx. 30%)

5 worksites are issued SWOs & total of 20 CFs issued

- No proper check for asbestos conducted before demolition
  - Contractors not aware of asbestos hazard



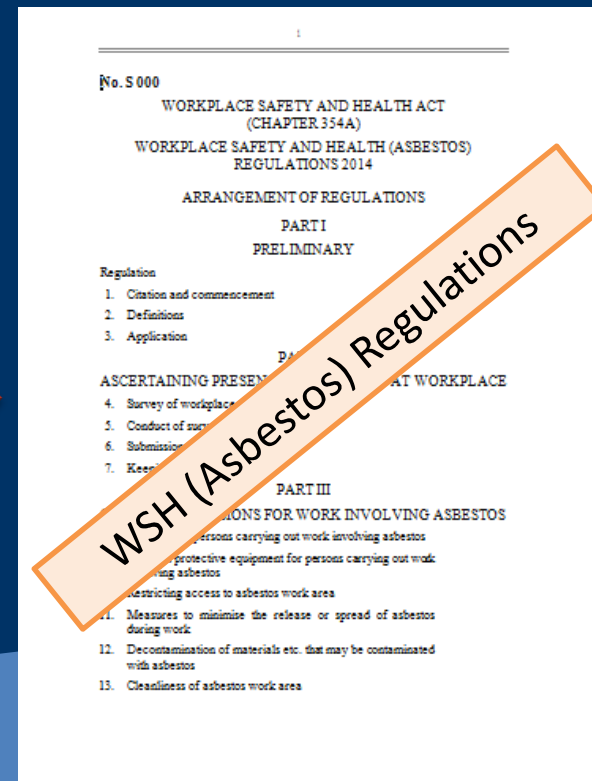
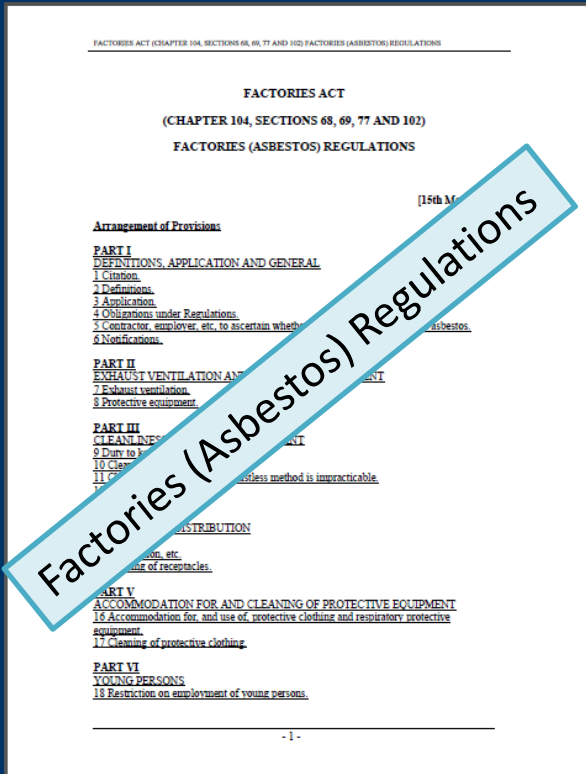
**A need for mandatory Asbestos Survey**





# WSH (Asbestos) Regulations

To enhance protection of workers against asbestos exposure

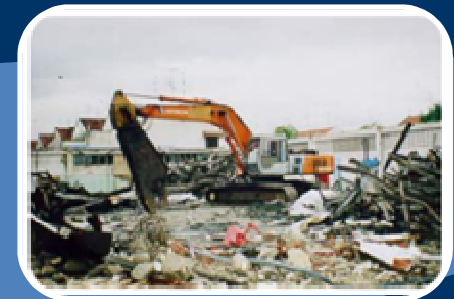


Effective date of operation : 1 May 2014

# WSH (Asbestos) Regulations

## Key changes:

1. Asbestos Survey to be carried out by a competent person to ascertain the presence of asbestos
2. Licensing of contractors carrying out asbestos removal work
3. Written plan of work to ensure asbestos removal work is carried out safely
4. Asbestos removal work to be supervised by a competent person
5. Technical requirements on asbestos work
6. Removal of ACMs before demolition of building





# WSH (Asbestos) Regulations

1. Definitions
2. Ascertaining Presence of Asbestos at Workplace
3. General Provisions for Work Involving Asbestos
4. Asbestos-Removal Work

# WSH (Asbestos) Regulations

## 1. Definitions

<b>asbestos</b>	crocidolite, actinolite, anthophyllite, amosite, tremolite, chrysotile, amphiboles or a mixture containing any of those minerals
<b>asbestos-containing material (ACM)</b>	a material, substance product or article containing asbestos
<b>work involving asbestos</b>	using, handling, treating, cutting, removing, storing, disposing or disturbing of asbestos or ACM at the workplace
<b>asbestos removal work</b>	any type of work involving asbestos that entails the removal of asbestos or asbestos-containing material from any building, plant, ship, structure, machine or equipment

# WSH (Asbestos) Regulations

1. Definition

2. Ascertaining Presence of  
Asbestos at Workplace

3. General Provisions for Work  
Involving Asbestos

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# WSH (Asbestos) Regulations

## 2. Ascertaining presence of asbestos

### Survey of workplace

(a) For any work, operation or process involving a material which is likely to contain asbestos e.g.

- Thermal insulation of pipe, boiler, etc;
- Sprayed insulation;
- Refractory lining;
- Gasket;
- Fire protection board, door, etc;
- Cable penetration insulation

**To appoint a competent person to conduct a survey to ascertain the presence of asbestos in the material before work**

*ACMs found in ships & plant facilities*



# WSH (Asbestos) Regulations

## 2. Ascertaining presence of asbestos

### Survey of workplace

(b) For demolition or renovation of any building built before 1 Jan 1991

**To appoint a competent person to conduct a survey of the building for presence of ACMs before work**

*Old buildings due for demolition*



# WSH (Asbestos) Regulations

## 2. Ascertaining presence of asbestos

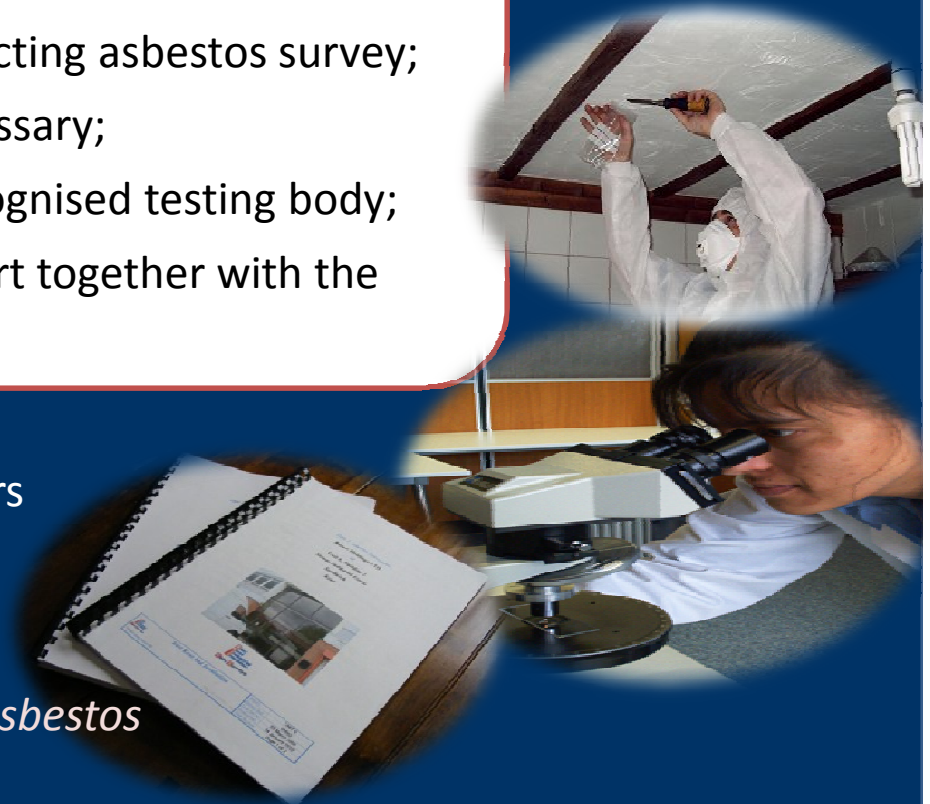
### Conduct of Survey

#### Duty of competent person\* for asbestos survey:

- To exercise care and diligence in conducting asbestos survey;
- To take samples for testing where necessary;
- To ensure samples are analysed by recognised testing body;
- To prepare and submit the survey report together with the analysis results

Survey report to be kept for at least 2 years

*\* Attended and passed the course on Survey Asbestos & Other Fibres Risks at the Workplace*





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# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

- Training for person carrying out asbestos work
- Restricting access to asbestos work area
- PPEs for person carrying out asbestos work
- Measures to minimise release or spread of asbestos
- Decontamination facilities
- Cleanliness of work area
- Storage and disposal of asbestos waste



# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### Training for person carrying out asbestos work

- Training programme to include topics on:
  - (a) harmful properties of asbestos and its health effects;
  - (b) Materials which contain or are likely to contain asbestos;
  - (c) Preventive measures to minimise exposure to asbestos;
  - (d) safe work practices and use of PPEs
  - (e) proper use, maintenance and limitations of RPEs;
  - (f) asbestos decontamination procedures;
  - (g) asbestos waste-handling procedures;
  - (h) Requirements for medical examinations
- Person to be trained at least once every 12 mths
- Training record to be kept for at least 2 yrs



# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### Restricting Access to Asbestos Work Area

- Ensure that no person has access to the work area unless he is authorized and wearing the appropriate PPEs
- Isolate asbestos work area using barricades or enclosures
- Display warning signs to warn of the hazards



Designated work area



Signage

Non-friable ACM  
removal

Barricades /partial  
enclosure

Friable ACM  
removal

Full enclosure

# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### PPEs for person carrying out asbestos work

- To provide and ensure the use of PPEs during work:
  - (a) disposable protective clothing
  - (b) suitable respiratory protection equipments (RPEs)
- RPE to be fit-tested to the person before first use and at least once every 12 mths
- Fit-test record to be kept for at least 2 yrs
- Provide proper storage facilities for PPEs to prevent contamination



# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### Take measures to minimise release of asbestos during work

Measures to include using:

- Wet methods
- Local exhaust ventilation, fitted with HEPA filter
- Appropriate work method e.g remove in whole without breaking ACMs, glove bags

Type of asbestos	Suitable wetting agent
Chrysotile <i>(hydrophilic)</i>	Water
Amosite, Crocidolite <i>(hydrophobic)</i>	Surfactant



Industrial vacuum cleaner



Glove bag



# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

Take measures to minimise spread of asbestos beyond work area

Measures to include:

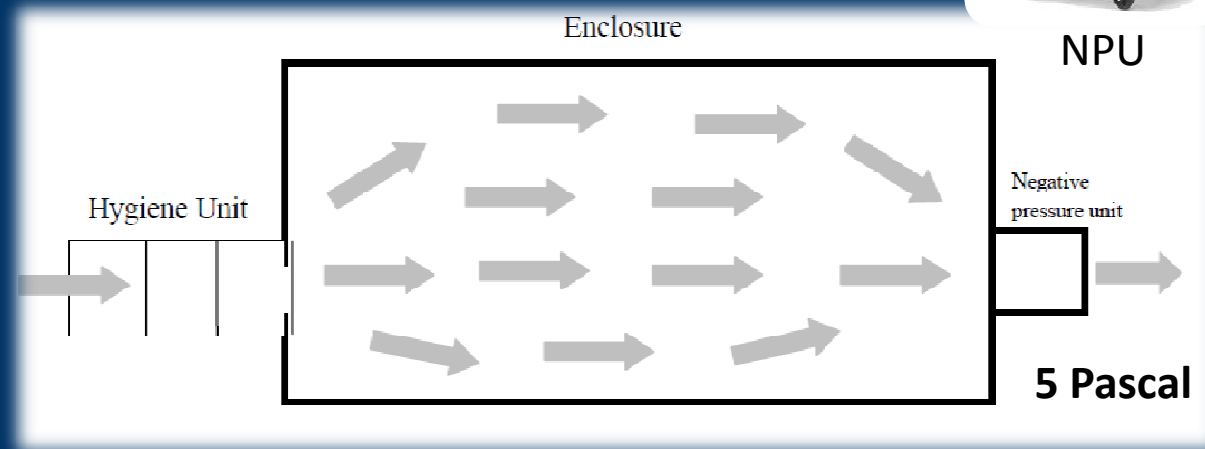
- Enclosing and maintaining negative pressure within work area
- Turning off and sealing any affected air-con system
- Filtering contaminated water through HEPA filter



NPU



Water filtration unit



# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### Decontamination facilities

- To provide adequate decontamination facilities
  - (a) to decontaminate any materials, tools or equipment before bringing out of the work area
  - (b) for personal decontamination



Non-friable ACM removal	Friable ACM removal
Wet wiped allowed	Shower facilities to be provided

# WSH (Asbestos) Regulations

## 3. General Provisions for Work Involving Asbestos

### Cleanliness of asbestos work area

- To ensure no accumulation of dust or debris during work
- To thoroughly clean the work area after completion of the work



Air clearance check  
( $< 0.01$  f/cc)

### Storage and disposal of asbestos waste

- Asbestos waste must be securely placed in sealed container or bag, with exterior properly decontaminated, before removing from work area
- To be affixed with a label to warn of the hazard
- To be disposed off as soon as practicable

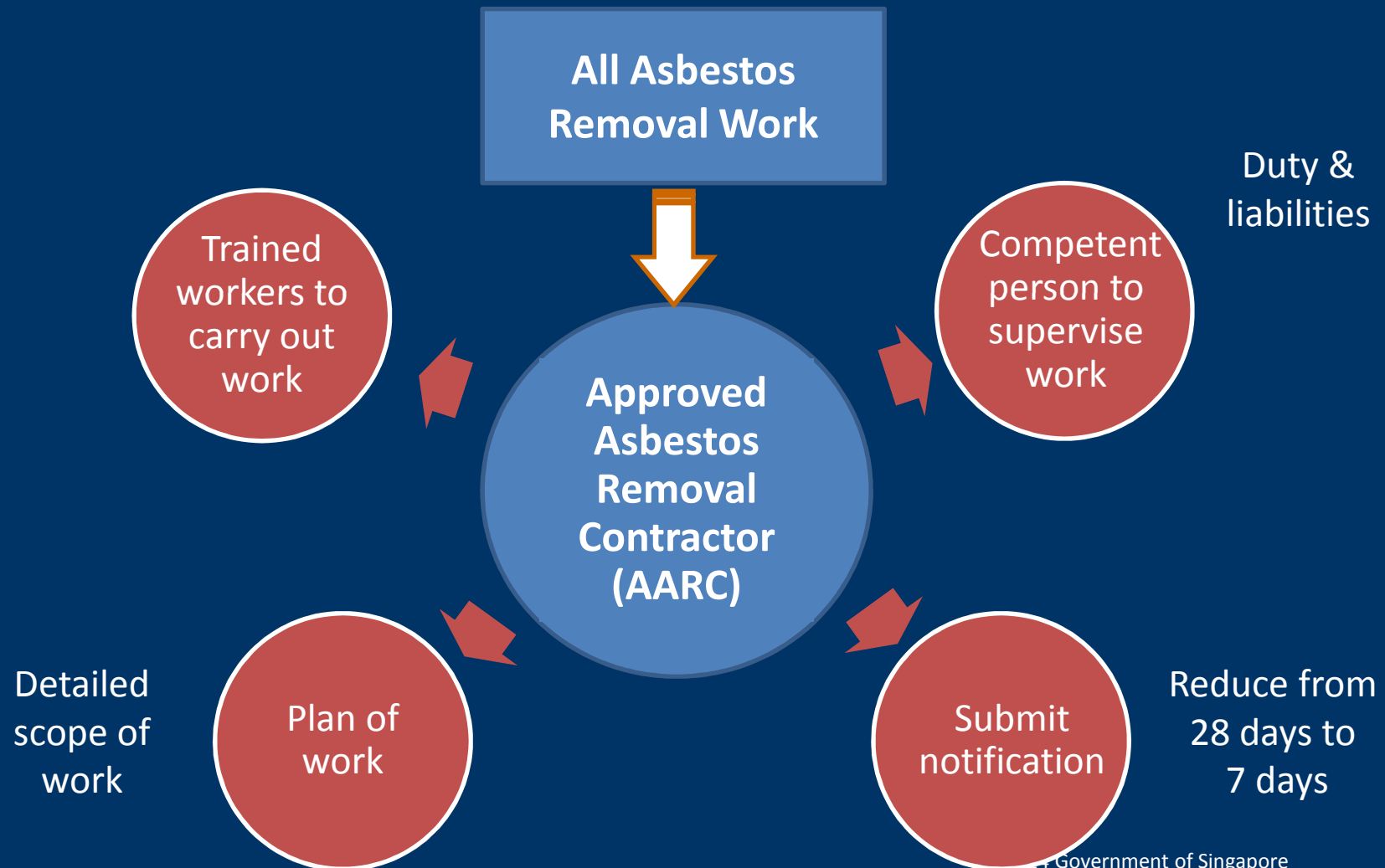


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# WSH (Asbestos) Regulations

## Licensing of contractors to carry out asbestos removal work



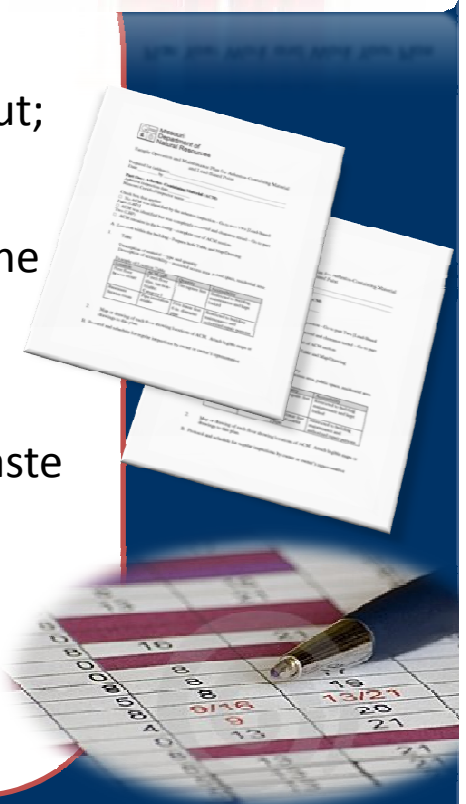
# WSH (Asbestos) Regulations

## Asbestos-removal plan of work

- Plan of work to include:
  - (a) the nature and duration of the asbestos-removal work;
  - (b) the exact location where the work is or is to be carried out;
  - (c) information on the type of asbestos or ACM involved;
  - (d) the methods of removal and the measures to minimise the release or spread of asbestos;
  - (e) decontamination procedures;
  - (f) the arrangements for storage and disposal of asbestos waste or contaminated equipment;
  - (g) monitoring of asbestos levels; and
  - (h) emergency procedures.
- Plan of work to be made available for inspection upon request



Plan Your Work and Work Your Plan





# WSH (Asbestos) Regulations

## Competent person to supervise asbestos-removal work

### Duty of competent person\* for asbestos removal:

- advise on all proper measures relating to the asbestos-removal work.
- ensure the asbestos removal plan of work is adequate, suitable and effective
- co-ordinate and manage the asbestos-removal work;
- ensure that only trained persons carry out the asbestos-removal work;

## Notification of asbestos-removal work

- To notify Commissioner of asbestos-removal work at least 7 days before commencement of work
- Keep a copy of the notification at workplace
- Make available for inspection upon request

\* *Attended and passed the course on Remove Asbestos from Workplace*

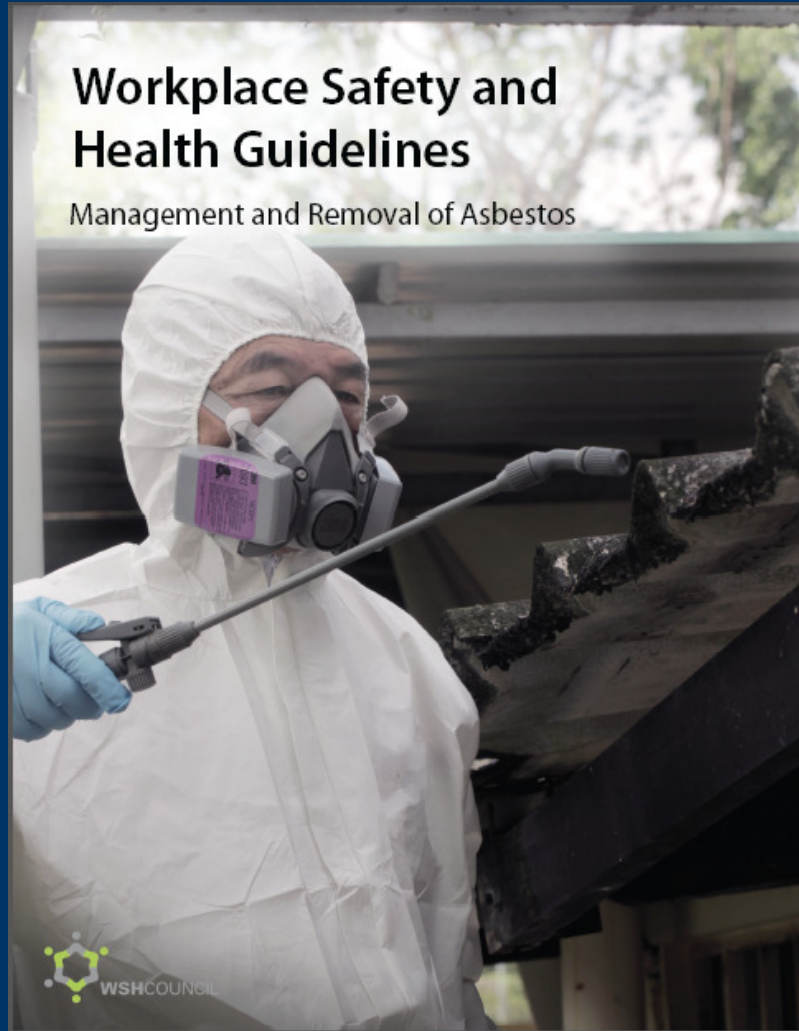
# WSH (Asbestos) Regulations

## Removal of ACMs before demolition of building

For buildings due for demolition, ensure all ACMs are removed, as far as reasonably practicable.



# Guidelines on the Management and Removal of Asbestos



To provide guidance to contractors and building owners on:

- Proper management of ACMs and
- Safe working with ACMs (for asbestos removal work)

Available for download at WSHC website  
[www.wshc.sg](http://www.wshc.sg)

# Management of Asbestos-Containing Materials

## 1. Hazard identification (determine whether asbestos is present)

- Building plan / records
- Age of building – built before 1991?
- Conduct survey
- Take samples for analysis for suspected materials



## 2. Risk assessment (determine the risk of exposure)

- Condition of material
- Exposed surface area
- Accessibility & activity
- Friability & content

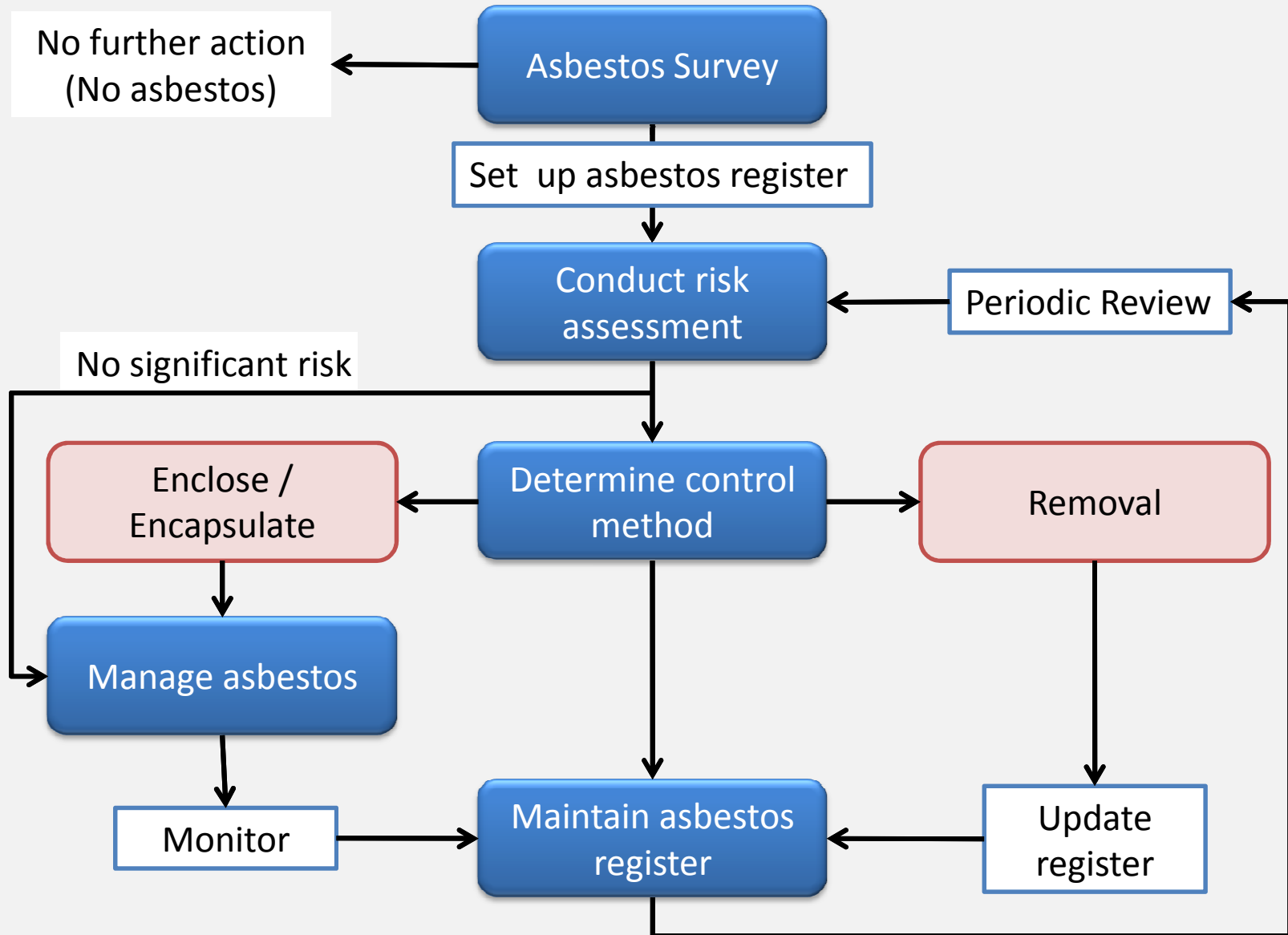


## 3. Corrective actions (take measures to control exposure)

- Removal
- Encapsulation
- Enclosure / containment
- Deferred action



# Management of Asbestos-Containing Materials



# Management of Asbestos-Containing Materials

## 1. . Asbestos register

- Record keeping
- Update asbestos register and management plan

## 2. Information / training

- Label ACMs / put up warning signs
- Awareness training

## 3. Isolate / restrict access

- Restricted zones with controlled entry
- Permit to work system

## 4. Monitor programme

- Periodic inspection (e.g. every 6 mths or annually)
- Monitoring exposure level

## 5. Reporting Procedure

- System for reporting damage / deterioration
- Procedure in place for accidental breakage



# Asbestos Control Programme



Asbestos

Chemical

Confined Space

Noise

## 1. Developing Standards

- Revised WSH (Asbestos) Regulations

## 2. Providing Compliance Assistance

- Guidelines on Management and Removal of Asbestos

## 3. Building Capabilities

- Reviewed Asbestos Removal Course
- Developed Asbestos Surveyor Course

## 4. Engagement & Education

- Seminars & Consultations with stakeholders

## 5. Targeted Enforcement

- Asbestos inspections, Demolition inspections

Reduce Asbestos-Related Diseases



Thank You !