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9 January 2017

Clerk to Public Accounts Committee
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Attention: Mr. Anthony CHU)

Dear Sir,

Public Accounts Committee
Consideration of Chapter 1 of the Director of Audit's Report No. 67
Maintenance and safety-related improvements of
public rental housing flats

With reference to your letter of 30 December 2016 addressed to the Secretary for Transport and Housing on the subject issue, I attach the required information at **Annex** for your consideration, please.

Yours faithfully,

(Connie KY Yeung)
for Secretary for Transport and Housing

c.c. Secretary for Transport and Housing	}	(w/ encl.)
Director of Buildings		}
Director of Fire Services		
Director of Environmental Protection		
Commissioner for Labour		
Secretary for Financial Services and the Treasury		
Director of Audit		

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At the public hearing of the Public Accounts Committee (PAC) held on 23 December 2016, we provided members with further information in relation to Part 4 of Chapter 1 of the Director of Audit's Report (the Audit Report) on the "Management of Asbestos-containing Materials in Public Rental Housing Estates". In response to enquiries raised by the PAC in its letter dated 30 December 2016, we provide our reply as follows:

(I) Management of Asbestos-containing Materials in Public Rental Housing Estates

- (a) In handling asbestos-containing materials (ACM), the Housing Department (HD) shall comply with the relevant ordinances such as the Air Pollution Control Ordinance (Cap. 311). However, in 1997, the Government exempted the Hong Kong Housing Authority (HA) from submitting asbestos investigation plans or asbestos abatement plans on maintenance, repair, handling or abatement of six types of ACM in HA's properties under section 69 (1) of the Air Pollution Control Ordinance.

As mentioned in paragraph 4.6 of the Audit Report, HD in conjunction with the Environmental Protection Department (EPD) and the Labour Department (LD), have established an inter-departmental Asbestos Working Group (AWG) to formulate asbestos management strategies for public rental housing (PRH) estates and compiled an Asbestos Management Manual to ensure compliance with the relevant ordinances and regulations. These include the investigation, maintenance, repair, handling or abatement of the balcony and staircase/lobby grilles. Please refer to Asbestos Management Manual at Attachment Item (I)(a) for details.

- (b) According to paragraph 2.3.4 of HD's Asbestos Management Manual, the majority of the ACM are cementitious with asbestos fibres bonded in cement and such bonded materials have very low possibility of releasing asbestos fibres into the air.

Encapsulated balcony grilles inside flats have been labeled with a triangular mark, which was agreed by the AWG (Attachment Item (I)(b) refers). There are no warning labels for the other ACM such as staircase/lobby grilles or chimneys in PRH estates.

Before the relevant legislation came into force on 19 June 1997, HD has been maintaining close communication with EPD through the

AWG. For example, during the AWG meetings held on 23 January 1997 and 22 May 1997, the Asbestos Management Manual was discussed and revisions had been made. Subsequently, a copy of the revised Asbestos Management Manual was sent to the EPD and the LD for record.

- (c) As mentioned in (b), the required labeling of a triangular mark on encapsulated balcony grilles inside flats was stipulated in the Asbestos Management Manual, which was compiled by the AWG comprising representatives of HD, EPD and LD. There are no warning labels required for the other ACM such as staircase/lobby grilles or chimneys in PRH estates.

According to the encapsulation record, HD has labeled the balcony grille encapsulation with a triangular mark in accordance with the Asbestos Management Manual.

- (d) As mentioned in paragraph 4.25 (e) (iv) of the Audit Report, HD will label all ACM in the estates and the label design will follow EPD's proposed design. At present, HD has installed these new warning labels for all asbestos containing staircase/lobby grilles. Labels will be installed for other ACM such as balcony grilles and chimneys in due course.
- (e) A total of 66 AWG meetings were held from 1988 to 2016. Minutes of all the meetings are available and the meeting dates are listed in chronological order at Attachment Item (I)(e)-1.

Regarding the respective roles of HD, EPD and LD in managing and monitoring ACM in PRH estates, reference can be made to the Terms of Reference of the AWG (Attachment (I)(e)-2 refers). HD is mainly responsible for the day-to-day management and monitoring of the ACM, while EPD and LD advise on the relevant ordinances and regulations.

- (f) The advice given under the Code of Practice on Asbestos Control issued by EPD is not a statutory requirement. As stipulated in paragraph 4.6 of the Audit Report, HD in conjunction with EPD and LD, have established an inter-departmental AWG to formulate asbestos management strategies for PRH estates and compile the Asbestos Management Manual to ensure compliance with relevant ordinances and regulations. HD has been maintaining close communication with EPD through the AWG to ensure an effective ACM management mechanism is implemented in PRH estates in accordance with the Asbestos Management Manual.

A comparison of the EPD's Code of Practice on Asbestos Control (Attachment-Item (I)(f) refers) and the HD's Asbestos Management Manual are as follows:

EPD's Code of Practice on Asbestos Control - Operation and Maintenance (O&M) Plan	HD's Asbestos Management Manual	
	Section Number	Remarks
- Detailed description of the premises	2.1	Followed in general.
- Organization of people for implementing the O&M plan	2.2 4.1 5.5	Followed in general.
- Details of any identified ACM and suspect material	3.2	Followed in general.
- Condition of the identified ACM and suspect material	3.3 5.4 5.6	Followed in general.
- Reasons why any ACM or suspect material should not be removed	3.3 3.5	Followed in general.
- Method of labeling the ACM	2.3	Refer to 2.3.4 The majority of ACM accessible to the tenants, public or HD staff are of the cement bonded type. Encapsulated balcony grilles inside flats containing asbestos have been

EPD's Code of Practice on Asbestos Control - Operation and Maintenance (O&M) Plan	HD's Asbestos Management Manual	
	Section Number	Remarks
		<p>labeled with a triangular mark. There are no warning labels for the other ACM such as the staircase/lobby grilles or chimneys in PRH estates.</p> <p>Please refer to paragraph 4.25 of the Audit Report for other enhancement measures.</p>
- Method of informing all people who may be affected	2.3	<p>Tenants: HD has distributed pamphlets to tenants, posted notices at G/F lobbies, kept asbestos records in estate management offices for inspection and labeled balcony grille encapsulation inside flats with the triangular mark.</p> <p>Workers: HD staff are aware of the location of ACM. They will issue works orders to maintenance contractors and monitor the works of the workers. In addition, balcony grille encapsulation inside flats have been labeled with the triangular mark.</p> <p>HD has uploaded asbestos information to the HA/HD website in 2009 for public inspection.</p> <p>Please refer to paragraph 4.25 in the Audit Report for other enhancement measures.</p>
- Surveillance scheme	2.3 3.5	<p>HD has a three-tier monitoring mechanism. Firstly, HD will inspect the condition of ACM in the estates through routine and half-yearly inspections. If irregularities are found, follow-up actions will be taken immediately. Secondly, random checks will be conducted to the asbestos inspection records by the Research and Development Unit. Thirdly, HD will</p>

EPD's Code of Practice on Asbestos Control - Operation and Maintenance (O&M) Plan	HD's Asbestos Management Manual	
	Section Number	Remarks
		appoint an independent registered asbestos consultant to carry out occasional review as an additional measure.
- Method to avoid disturbing the ACM	2.3	Followed in general.
- Record keeping scheme	3.2	Followed in general.
- Actions for handling deteriorating ACM	2.4 3.3	Followed in general.

- (g) HD staff are aware of the location of ACM. They will issue works orders to maintenance contractors and monitor the works of the workers. In addition, the balcony grille encapsulation has been labeled with the triangular mark. In the past, HD has distributed pamphlets to tenants, posted notices at G/F lobbies and kept asbestos records in estate management offices. HD further uploaded asbestos information to the HA/HD website in 2009 for public inspection.

To enhance communication and staff awareness of the asbestos issue, HD has taken various enhancement measures. Details are given in paragraph 4.25 of the Audit Report.

- (h) Some requirements stipulated in the Asbestos Management Manual compiled by HD, EPD and LD are higher than EPD's Code of Practice on Asbestos Control. As far as monitoring of ACM is concerned, EPD's Code of Practice on Asbestos Control recommends inspection at least once every two years, but the HA will inspect the ACM once every half year and has a three-tier monitoring mechanism. Firstly, the condition of ACM in PRH estates is inspected through routine and half-yearly inspections. If irregularities are found, follow-up actions will be taken immediately. Secondly, random checks will be conducted to the asbestos inspection records by the Research and Development Unit. Thirdly,

HD will appoint an independent registered asbestos consultant to carry out occasional review as an additional measure. The monitoring mechanism will also be discussed at AWG meetings from time to time.

- (i) In the past, HD used to convey ACM records in writing, not in a pictorial format. Some frontline staff may not fully understand the location of the ACM. Now, HD has re-examined all asbestos records in estate management offices and adopted a pictorial format for public inspection at G/F lobbies in PRH estates.

Information of ACM is reviewed and updated from time to time by HD. Registered asbestos consultants will be appointed to provide technical assistance on asbestos issues. In 2016, HD instructed a registered asbestos consultant to conduct a comprehensive inspection of ACM in the record.

- (j) The condition of ACM in PRH estates is mainly inspected by the regional Assistant Clerks of Works (ACW). At the time of appointment, ACWs are required to have a diploma or higher certificate in construction studies and three years of relevant working experience. During the inspections, they checked whether the damaged ACM has exceeded 5% or 10% of the ACM area according to the Asbestos Management Manual and decide to take further follow-up actions. If there is any problem, they will report to the supervisors and ask for instructions. As mentioned in (h), this is the first tier of the ACM monitoring mechanism of HD.

In collaboration with EPD and LD, HD has established an inter-departmental AWG to formulate asbestos management strategies for PRH estates and compile the Asbestos Management Manual. The 10% or 5% assessment criterion was developed by the asbestos consultant in the 1990s during compilation of the manual and had been referred to the AWG for discussion and subsequent implementation.

- (k) For ACM inspections by the Research and Development Unit, please refer to paragraphs 4.22 (a) - (c) of the Audit Report.

- (l) The five unannounced estates/blocks mentioned in the Audit Report are Choi Hung Estate, Fuk Loi Estate, Tai Yuen Estate and Long Bin Interim Housing Estate, and also the chimney in Fu Lai House of Fu Shan Estate.

The ACM of the four estates (Choi Hung Estate, Fuk Loi Estate, Tai Yuen Estate and Long Bin Interim Housing Estate) are located on the rooftop which is not easily accessible to the general public and residents. The Maintenance Planning and Review Committee (MPRC), an internal HD senior-level committee, at its meeting held on 29 June 2009, discussed and decided to upload information on ACM building elements to the HA/HD website. Subsequently, Senior Maintenance Surveyor/Research and Development, uploaded the relevant information to the HA/HD website according to the MPRC decision for public inspection.

Although the ACM in the four estates have not been labeled, frontline staff have been conducting regular inspections and no abnormalities have been found. In addition, the Research and Development Unit conducted inspections to these ACM in 2009, 2010, 2015 and 2016 and found that they were in good condition (Attachment I - Item (I)(l) refers). HD staff are also aware of the location of the ACM. They will monitor the works of the workers upon the issue of works orders to the maintenance contractors.

- (m) The four reports were submitted by HA to the Panel on Housing of the Legislative Council on the performance of environmental targets and initiatives in respective years. Amongst the report items, one of them was the control of hazardous materials in existing estates. The ACM in the four estates have been in good condition and there was no abnormality.
- (n) As mentioned in (l), frontline staff have been conducting routine inspections and no abnormalities have been observed. In addition, the Research and Development Unit conducted inspections of these ACM in 2009, 2010, 2015 and 2016 and found that they were in good condition. Attachment I - Item (I)(l) refers.

- (o) According to HD's record, the latest full asbestos record before 2009 is the one dated October 2007 (Attachment - Item (I)(o) refers). Except the chimney at Fu Lai House in Fu Shan Estate, the five estates are on the list.

- (p) The office of the Long Bin Interim Housing Estate was originally part of the former Long Bin Temporary Housing Area (THA). Long Bin THA was designed and built in 1984 and was completed in 1985. Although the use of ACM was banned by HD in 1984, some of the projects with design completed or under construction, such as Long Bin THA, might still contain building elements with ACM. As the former Long Bin THA was demolished long time ago, the relevant documents for the decision to continue the use of these materials are not available.

- (q) HD has arranged a comprehensive review of all asbestos containing staircase/lobby and balcony grilles by a registered asbestos consultant. The consultant considered that these cases were of a minor nature and confirmed that no follow-up works were required. Nevertheless, HD has asked the consultant to recommend follow-up plans. Subsequently on the advice of EPD and LD, HD has completed the remedial works. In addition, new warning labels will be installed to indicate the presence of ACM to alert on the use with care and to avoid disturbing the ACM.

Please refer to paragraphs 4.25 and 4.36 of the Audit Report for details of follow-up works and recommendations of enhancement.

In addition, HD has written to all tenants concerned and contacted them to ensure that they are aware of the impact of the asbestos abatement works.

HD has been in liaison with the Department of Health (DH) for their professional advice. Residents are advised to consult their doctors if in doubt. Residents could also visit the website of EPD, LD and DH for more information on asbestos.

***Note by Clerk, PAC:** Attachment - Item (I)(o) not attached.

- (r) From our record, the concerned tenants have not made application to HD for installation of the air conditioners. Since the installation works would take only one or two hours to complete, frontline staff might not be able to notice such works and require the tenants to stop the installation of the air conditioners promptly.

HD appointed a registered asbestos consultant in mid-2016 to inspect the supporting frames of the air conditioners. It was found that these cases were of a minor nature and confirmed that no follow-up works were required.

- (s) HD considers it necessary to enhance the alertness of frontline staff in handling ACM and has adopted a series of enhancement measures. Please refer to paragraphs 4.25, 4.36 and 4.46 of the Audit Report for details.

- (t) The chimney in Case 3 was the property of the restaurant licensee. As the chimney was installed at the exterior of the building, it had been inspected by the HD to ensure that it was in good condition. Its condition had always been recorded and followed up by HD as letters were sent to the licensee on 14 January, 17 January and 3 May 2011 advising him to employ a qualified contractor for the damaged chimney.

As the chimney was owned by the restaurant and the licensee was responsible for employing the contractor or workers directly to carry out the removal works, HD had no obligation to supervise the works of the contractor or workers.

As regards the management of ACM in PRH estates, HD has taken a series of enhancement measures. Please refer to paragraphs 4.25, 4.36 and 4.46 of the Audit Report for details.

ASBESTOS MANAGEMENT

SECOND EDITION - MAY 2009

Review Authority : CM/M(PM)

Contact Point : SMS/R&D

Issued by the Chief Manager/Management ([Project Management](#))
Housing Department, Hong Kong

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Reviewed for adequacy, approved and authorized for issue :



(William W.L. HO)

Chief Manager / Management (Project Management)

The Contact Point and the Review Authority for this Technical Guide are Senior Maintenance Surveyor / Research & Development and Chief Manager / Management (Project Management) respectively.

1.0 PURPOSE

1. The policy responsibilities and procedures for the management and abatement of asbestos containing materials (ACM) in properties under the management of the Housing Department or its management agents, including HA property and Estate Schools, are described in the following documents:

EMDTG07 Asbestos Management;

MWPM03 Selection & Appointment of Contractor

MWPM07 Programme Planning

EMDTG08 Asbestos Technical Guidelines;

SL Specification Library

2. The contents of this Technical Guide are for reference only, departure is permitted on justifiable grounds as determined by the Action Officer.

2.0 PLANNING

2.1 Policy

GENERAL

1. Various types of asbestos containing materials (ACM) were used in Housing projects before asbestos was known to be harmful to health. The significance of asbestos and its effect on health is detailed in Section 5.2, Significance of Asbestos. The Housing Department has formulated a policy on asbestos and developed an overall asbestos management strategy for the management of the existing ACM in Housing property.

POLICY ON ASBESTOS

2. The Department will endeavour to minimise as far as reasonably practicable the risk to its tenants, the public and its staff arising from asbestos-containing materials in its property stock.

ASBESTOS MANAGEMENT STRATEGY

3. The Housing Department's overall asbestos management strategy is summarized below :
 - (a) to establish and update a central record of all relevant information related to asbestos.
 - (b) to communicate effectively and accurately the information both within the Department/its management agents and with external parties such as other Government Departments, media, tenants' groups, etc.
 - (c) to plan effectively for necessary abatement works and set priorities for action.
 - (d) to provide necessary resources for implementation of the management programme.
 - (e) to coordinate the effects of different divisions of the Department in an overall management programme.
 - (f) to define responsibility among different parties concerned in the asbestos issue e.g. the Housing Department, the tenants, the contractors etc.
 - (g) to monitor and control effectively the on-going asbestos abatement works and subsequent safe dumping of asbestos waste.

2.2 Responsibility

GENERAL

1. The Housing Department's asbestos management strategy is implemented through the Asbestos Management Programme / ad-hoc asbestos abatement works when considered necessary.
2. The HD Asbestos Working Group (AWG) which is chaired by CM/M(PM), advises AD(EM)2 on the implementation of the Department's asbestos management strategy and monitors the Asbestos Management programme.
3. The AWG comprises representatives from the Housing Department, the Environmental Protection Department, the Labour Department.
4. The Housing Department representatives include the following coordinators :
 - (a) CM/M(PM) for the Estate Management Division,
 - (b) SMS/R&D for the Estate Management Division, (BW Section),
 - (c) SSE/15 for the Development & Construction Division,
 - (d) SE/122 for the Development & Construction Division,
 - (e) SE/SIS3 for the Estate Management Division (SE Section),
 - (f) HM/BPS2 for the Estate Management Division,
 - (g) MS/ENV for the Estate Management Division, (BW Section),
 - (h) CTO(BS)/TD for the Estate Management Division (BS Section)

ASBESTOS WORKING GROUP

5. The AWG receives and considers information on materials containing asbestos in Housing Authority (HA) Managed Properties or the properties managed by the HA's agents, develops and monitors the Housing Department's asbestos abatement programmes and advises the Director of Housing on the continued development of the asbestos abatement strategy.
6. The List of Registered Asbestos Contractors / Consultants / Supervisors / Laboratories is managed by EPD.
7. Refer to Section 5.2 for the detailed terms of reference and membership of the AWG.

HD RESPONSIBILITIES

8. The Assistant Director/Estate Management(2), AD/EM(2), is responsible for the implementation of the Asbestos Management programme within the Estate Management Division, and the management of the central records of information related to asbestos.
9. The Assistant Directors of the Construction Division are responsible for administering demolition contracts.
10. The Chief Manager/Management (PM) is responsible for the coordination and recording of the asbestos abatement activities within the Estate Management Division and the coordination of central records on ACM and specialist contractors.
11. The detailed responsibilities and procedures for asbestos abatement activities are set out in this Technical Guide.

2.3 Management Strategy

GENERAL

1. The Asbestos Management Programme provides a comprehensive plan for the implementation of the Housing Department's asbestos management strategy. The programme includes the following asbestos management activities :
 - Identification of ACM
 - Training
 - Personnel Protection
 - Periodic ACM Surveillance
 - Central Records
 - Abatement
 - Emergency Procedures
 - Special Procedures

IDENTIFICATION OF ACM

2. Most of the existing Asbestos Containing Materials within property managed by the Housing Department & HKHA's management agents have been identified and the type of asbestos, location and condition recorded.
3. Where records do not exist of a material suspected of containing asbestos, staff arrange for the material to be sampled in accordance with Section 5.6, BULK SAMPLING, and report the results on Form [EMDTG07-F02](#) to SMS/R&D or CTO(BS)/TD as appropriate. The results of any bulk sampling arranged during the course of demolition works are copied to SMS/R&D.
4. The majority of ACM materials accessible to the tenants, public or HD staff are of the cement bonded type, and due to the quantities involved these have not been individually labelled. Where balcony grill panels containing asbestos have been encapsulated since 1989, these have been marked to aid later identification. Refer to Section 3.3, ASBESTOS ABATEMENT.
5. Staff are notified of the location and condition of ACM through regular reports based on the central records of ACM. Tenants and the public can view these reports at the relevant Estate Office.
6. New materials used in the construction and maintenance of property are screened for [free of](#) asbestos before being approved for use.

TRAINING

7. HD staff are provided with training on a need basis to ensure that they are aware of the possible occurrence of ACM in buildings and in materials, and to ensure that they are familiar with the policy, responsibilities and procedures for the management and abatement of asbestos.
8. Staff required to use personal protective equipment in the inspection and monitoring of asbestos abatement activities are provided with training in its care and use.

PERSONNEL PROTECTION

9. The risk of staff being exposed to asbestos dust is low, however, staff who are required during the course of their duties to enter a space where asbestos dust is present or liable to escape are provided with the appropriate respiratory protective equipment and protective clothing in accordance with the Factories and Industrial Undertakings (Asbestos) Regulations.
10. All staff who are involved in asbestos abatement works are provided, free of charge, with the opportunity to have their health and physical condition checked for fitness to wear respirators. Staff with severe lung disabilities are strongly advised to undergo a medical examination prior to taking up the inspection of asbestos work.
11. For further details refer to Section 3.1, PERSONNEL PROTECTION.

HALF-YEARLY PERIODIC ACM SURVEILLANCE

12. Periodic surveillance of ACM is carried out through an [half-yearly](#) condition survey of asbestos containing building elements. The result of the surveys and any proposed changes to the asbestos abatement programme are recorded, and the central records updated at the end of [each survey](#).
13. The condition of existing ACM in building services equipment is monitored and checked during routine maintenance.
14. If at any time it is suspected that an additional material or element may contain asbestos, samples are collected and analysed to verify the presence of asbestos. If the result is affirmative, the additional material / element will be replaced with asbestos free materials and recorded accordingly.
15. For further details refer to Section 3.5, [HALF-YEARLY](#) ACM SURVEILLANCE.

CENTRAL RECORDS

16. Central records being maintained contain information related to asbestos, including :
 - all ACM, the location, condition and the type of asbestos contained.
 - abatement programmes and activities.
17. For further details refer to Section 3.2, CENTRAL RECORDS.

ABATEMENT

18. Asbestos abatement activities carried out under the Asbestos Management Programme include the encapsulation and removal of ACM. These activities are carried out in accordance with agreed programmes and procedures.
19. For further details refer to Section 3.4, ABATEMENT PROGRAMME and Section 3.3, ASBESTOS ABATEMENT.

EMERGENCY PROCEDURES

20. HD procedures for dealing with emergencies involving asbestos include procedures to deal with :
 - emergency repair to underground asbestos cement watermains.
 - emergencies during the course of Asbestos Abatement work.
21. In the case of asbestos contamination, immediate steps shall be taken to restrict access to the contaminated area, erect warning signs, verify the asbestos contamination and arrange for decontamination.
22. Any person who may have touched the contamination in any way should be advised to wash their hands, hair and face, or to take a thorough shower as soon as practicable.
23. Emergencies during the course of Asbestos Abatement work include :
 - spillage of contaminated debris outside the work area
 - exceeding the Environmental Control Limit of 0.01 fibres/mL
 - a fire in or adjoining the work area
 - the raising of a Number Three Typhoon Signal (or above)
 - a worker collapses or some other accident occurs
24. For further details refer to Section 5.7, EMERGENCY PROCEDURES and the respective Divisional documentation.

SPECIAL PROCEDURES

25. Special procedures covering asbestos management are set out in the respective Divisional documents and include detail procedures for :
 - contracting
 - specification
 - work methods
 - monitoring
 - inspection
 - testing
 - remedial action
 - records

2.4 Abatement Programme

GENERAL

1. The asbestos abatement activities carried out under the Asbestos Management Programme are coordinated by way of the following programmes :
 - the Asbestos Abatement Programme; and
 - the Redevelopment Programme

ASBESTOS ABATEMENT PROGRAMME

2. All the asbestos abatement works planned and undertaken by the Estate Management Division are recorded in a asbestos abatement programme.
3. The asbestos abatement programme is maintained by SMS/R&D, based on abatement works reports and ACM condition information provided as a result of the periodic surveillance of ACM.
4. SMS/R&D updates the asbestos abatement programme when significant changes are required.
5. There is no specific programme to remove ACMs from building services equipment, however the condition of such ACM is inspected during the routine maintenance and testing of the equipment. When the inspection reveals that the ACM warrants removal, it is replaced with an asbestos-free substitute whenever practicable.

REDEVELOPMENT PROGRAMME

6. The demolition of older Housing Blocks for redevelopment purposes is planned and undertaken in accordance with the Redevelopment Programme. As a result, all existing ACM in these blocks will be removed during the demolition of the blocks.

3.0 MANAGEMENT

3.1 Personnel Protection

GENERAL

1. The approach to asbestos removal adopted by the Department is intended to minimise as far as reasonably practicable the risk to its tenants, the public and its staff arising from the removal of the ACM. The approaches adopted depend on the type of ACM involved and include negative pressure full containment, partial segregation and open air removal with wetting and careful dismantling.
2. Where the asbestos removal requires the full containment approach, inspection by HD staff is normally from outside the containment by means of a viewing panel. Where full containment is not required, inspection by HD staff normally involves occasional visits to works areas where the air-borne dust level has been established to be well below the air monitoring control levels.
3. Although the risk of HD staff being exposed to asbestos is low, the Factories and Industrial Undertakings (Asbestos) Regulations, require that respiratory protective equipment and protective clothing must be worn by every person employed in connection with an asbestos abatement process or in a place into which asbestos dust is liable to escape.
4. As the use of a filter type respirator may affect the health of people who suffer from severe lung disabilities, a medical examination, including chest X-ray and lung function test, is necessary for all staff who are likely to be involved with asbestos abatement inspection duties. People most likely to be affected are those who suffer from chronic bronchitis, asthma, chronic obstructive airway diseases, silicosis or advanced cases of pulmonary TB.

MEDICAL EXAMINATION

5. All HD staff who are likely to be involved in asbestos abatement works are provided, free of charge, with the opportunity to have their health and physical condition checked for fitness to wear respirators. Staff with severe lung disabilities are strongly advised to undergo a medical examination prior to taking up the inspection of asbestos work.
6. Staff who are concerned that their respiration has deteriorated or is adversely affected because of illness, or those who wish merely to have their respiration checked may, at any time, (prior to or during duties involving the inspection of asbestos abatement work) request a medical examination.
7. Requests for medical examinations are submitted in memo form to the appropriate Chief Professional Officer for professional staff or to the appropriate Chief Technical Officer for site staff. The officer concerned reviews the request and forwards it to CM/M(PM) for the necessary arrangements to be made. Refer to sample memo [EMDTG07-F03](#).

USE OF HALF-FACE RESPIRATOR

8. The respiratory protection provided by the half-face respirator is dependent on the effectiveness of its fit to the face of the wearer. Two tests that may be carried out to check that the half-face respirator fits satisfactorily are the Positive Pressure Fit Test and the Negative Pressure Fit Test. The tests are conducted as follows :

a) Positive Pressure Fit Test

Completely cover the exhaust with the palm of the hand and breathe out slightly. The respirator fit is effective if it lifts slightly away from the face and no air leaks out.

b) Negative Pressure Fit Test

Completely cover the cartridges with the palm of the hands and breathe in slightly. The respirator fit is effective if it sticks slightly to the face.

3.2 Central Records

GENERAL

1. The Chief Manager/Management (PM) is responsible for the recording of the asbestos abatement activities within the Estate Management Division and the coordination of central records on ACM
2. SMS/R&D and CTO(BS)/TD are responsible for the maintenance of the building works and building services records respectively.
3. As, BSEs and SEs of the Development & Construction Division are responsible for supplying the Estate Management Division coordinators with information on their asbestos abatement activities for updating the central records.

ACM RECORDS

4. SMS/R&D maintains central records of asbestos related information for building elements, including:
 - survey records and bulk sampling reports on the location and condition of the ACM;
 - the type and quantity of asbestos contained; and
 - the dates of any enclosure/encapsulation etc.
5. CTO(BS)/TD maintains central records of all asbestos containing building services installations.

ABATEMENT PROGRAMMES

6. SMS/R&D maintains an asbestos abatement programme recording all the asbestos abatement works planned and undertaken by the Building Works Sections of the Estate Management Division.
7. MSs are responsible for supplying SMS/R&D with ACM condition information after each condition survey to update the Asbestos Abatement Programme.

LISTS OF REGISTERED ASBESTOS CONSULTANTS, CONTRACTORS, SUPERVISORS AND LABORATORIES

8. The updated lists of Registered Asbestos Consultants/Contractors/Supervisors/Laboratories can be viewed at EPD's website: <http://www.epd.gov.hk/epd>.

REPORTS

9. SMS/R&D prepares reports on asbestos recording :
 - the progress of all abatement works for the current year;
 - a summary of major types of ACMs; and
 - the number of blocks in Housing Properties with ACMs.

3.3 ASBESTOS ABATEMENT

GENERAL

1. Asbestos abatement activities carried out under the Asbestos Management Programme are carried out in accordance with agreed programmes and procedures. These activities include the encapsulation and removal of ACM.

ENCAPSULATION

2. The encapsulation method of asbestos abatement is generally confined to staircase and balcony grille panels. Where the panels are in good condition the work method set out in EMDTG08 is followed and the work is treated as normal building maintenance work, and is carried out by the Housing Department's Contractors.
3. Most asbestos balcony grille panels of properties managed by Housing Department or HKHA's management agents have been encapsulated. It is intended that the remaining panels also be encapsulated if access and other constraints can be overcome.
4. Upon completion of the work, the Project MS records the encapsulation in Form [EMDTG07-F05](#) and submits the form to SMS/R&D for the updating of the central record.

ASBESTOS REMOVAL

5. Asbestos removal activities are carried out under the Asbestos Abatement Programme and the Redevelopment Programme.
6. [Development &](#) Construction Division staff arrange for asbestos removal works under the Redevelopment Programme.
7. Estate Management Division staff arrange for asbestos removal works under the Asbestos Abatement Programme or on need basis.
8. Not all works involving the removal of ACM from HA properties are included in the programme, which primarily covers the large scale works involving the removal of a particular type of ACM from a whole block.
9. Where any individual panel or section of ACM becomes defective and warrants abatement without delay, the MS shall arrange for its removal or abatement as appropriate regardless of whether such was included in the current programme or not.
10. On occasions the Estate Management Division may request the removal of ACM from squatter structures. Refer to Section 4.5. [\(Deleted\)](#)
11. Estate Management Division BS staff arrange for the removal of friable ACM found in building services installations that warrants abatement.

ASBESTOS ABATEMENT PROCEDURES

12. The detailed responsibilities and procedures for the abatement of asbestos containing materials are described in Sections 3 and 4, and the following Divisional documents :

- The Asbestos Technical Guidelines, EMDTG08.
- [Development &](#) Construction Division's SE Technical Guide to Asbestos Removal (DSEG-ASB).

ASBESTOS ABATEMENT SPECIFICATIONS

13. Detailed specifications for the asbestos abatement works are prepared at Divisional level setting out specific requirements where necessary concerning:

- Statutory obligations and codes of practice
- Use of Registered Asbestos Consultants, Contractors, Supervisors & Laboratories
- Preliminary site visits and surveys for asbestos
- Notifications to Government authorities
- The submission required with tenders/quotations
- The submission required before the works may commence
- Asbestos removal works programmes
- Site supervisors
- Air monitoring
- Approvals for commencement of work
- Personnel access to sites and signage
- Equipment and materials
- Maintenance and testing of plant and equipment
- Decontamination facilities
- Containments
- Methods of removal
- Control limits for airborne asbestos dust levels
- Suspension of works
- Acceptance of asbestos removal work
- Disposal of contaminated waste
- Project records
- Decontamination
- Emergency procedures during course of asbestos removal works
- Payment of works

ASBESTOS REMOVAL WORK METHODS

14. Detailed removal methods for the asbestos abatement works are prepared at Divisional level for each type of ACM. The work methods set out specific guidelines concerning:

- Associated non asbestos works
- Equipment required
- Preliminary cleaning
- Zoning of works
- Containments/segregation
- Decontamination facilities
- Protective equipment required
- The removal work
- Preparation for visual inspections
- Air monitoring on completion of works
- Waste disposal

- Air monitoring strategy

WORKS MONITORING

15. In the management of asbestos abatement works HD staff/[Estate Manager \(Maintenance\) of PSA \(applies to all "PSA" as mentioned in this manual\)](#) closely monitor the works to ensure that the Registered Asbestos Contractor complies with the regulations and the specified requirements. An important part of this monitoring involves the monitoring of air test samples. Registered asbestos consultant is to be engaged for asbestos abatement work for non-exempted works.
16. Before commencement of any preparation work on site, background air tests are carried out. Environmental, leakage and personal air monitoring tests are carried out during asbestos removal work and penultimate, clearance and reassurance air monitoring tests on completion of the works. An air monitoring strategy is included in the approved work methods for the works.
17. Air monitoring is carried out by Registered asbestos Laboratories through HD's materials testing services term contracts, and requests for air monitoring tests are made to SCE/MTM using Form DCMM-F03.
18. Refer to section 6.5, AIR MONITORING.

3.4 Approved Specialist Contractors

LISTS OF REGISTERED ASBESTOS CONSULTANTS, CONTRACTORS, SUPERVISORS AND LABORATORIES.

1. The Environmental Protection Department (EPD) maintains and manages lists of Registered Asbestos Consultants, Contractors, supervisors and Laboratories.
2. The current lists can be viewed at EPD's website: <http://www.epd.gov.hk>.

PERFORMANCE OF REGISTERED ASBESTOS CONTRACTORS/CONSULTANTS/SUPERVISORS

3. On the completion of an asbestos abatement project, the MS/BSE of the Estate Management Division and the PSA in charge of the project completes a report on the performance of the Registered Asbestos Contractor, using Form [EMDTG07-F01](#). Should the project MS/BSE or the PSA find that the performance of registered asbestos consultants is poor they shall also report to SMS/R&D.
4. Reference should be made to all project records and all items of non-compliance recorded on the form. The report is countersigned by the senior professional officer and submitted, together with copies of all supporting project records and documents for items of non-compliance, to SMS/R&D within one week of the completion of the project. The BSE submits the report via CTO(BS)/TD.
5. SMS/R&D reviews the report and submits, where the poor performance of the above asbestos professionals is noted with recommendations as appropriate to EPD and LD (Attn.: S(RW)6, Asbestos Management & Control Section (1), EPD and SOH(D), Occupational Hygiene (Development) Division, LD).

3.5 Periodic ACM Surveillance

GENERAL

1. An [half-yearly](#) condition survey of asbestos containing building elements in each area is carried out by the MS, SCW and PSA concerned. The results of the surveys are recorded on Form [EMDTG07-F04](#) and submitted to SMS/R&D at the end of each condition survey.
2. SMS/R&D carries out a random check of the submissions and advises the MS/SCW/PSA of any discrepancies.

ASSESSMENT

3. Each "ACM unit" (i.e. a whole panel, a whole length of pipe in one storey, a roof tile, a piece of corrugated sheet) is initially inspected and considered independently. Those damaged parts that are clustered at the one point are defined as localized. Single cracks that can be found in various locations on the ACM unit are taken as scattered.
4. Using the definitions above, if localized damage exceeds 10% of the total area or length of that ACM unit, or if scattered damage exceeds 5% of the total area or length of that ACM unit, that ACM unit will be considered as "in poor condition".
5. After assessing all ACM units independently in the one building, the number of "poor" ACM units is calculated and divided by the total number of ACM units to obtain the percentage of poor ACM units. If the proportion so calculated exceeds 10%, all poor ACM units should be removed without delay and the rest of the same type of ACM in the building included in the asbestos abatement programme.
6. If any length of asbestos pipe is in poor condition, the whole stack should be removed. If the number of stacks to be removed is more than 10% of the total number of stacks in the building, the remaining stacks should also be included in the asbestos abatement programme.
7. The condition of each asbestos containing building element is inspected in accordance with the guidelines set out below.

GRILLES (STAIRCASE/BALCONY/LOBBY)

8. Initial inspection is conducted on the exterior using binoculars. The grille conditions are assessed according to the following :-

Satisfactory : No visible damage (major cracks or chipping) or up to 5% of area scattered OR up to 10% of area localized damage.

Poor : More than 5% of area scattered or more than 10% of area localized damage (major cracks or chipping).

9. Those panels classified as "poor" are inspected at close range. The potential for further deterioration is assessed. Those that can easily be reached by occupants (without employing any physical aid) are classified as accessible. Where this is the case, the grille is recorded and put on an immediate removal programme.
10. The above guidelines also apply to encapsulated grilles.

CORRUGATED SHEETS

11. As the corrugated sheets are predominantly used as canopies, and are therefore installed in a slanting manner, external inspection through the use of binoculars might not be practicable, but would provide an initial assessment. As the corrugated sheets are generally only accessible via the residential units, those able to be covered by the initial assessment can be eliminated thereby minimizing the disturbance to tenants.

12. Where it is not possible to assess the condition of the corrugated sheets through an initial assessment, the sheets are inspected at close range. The assessment criteria are as follows :-

Satisfactory : No visible damage i.e. no chipping, breakage, or hole on the Corrugated Sheet or up to 5% of area scattered OR up to 10% of area localized damage.

Poor : More than 5% of area damage or more than 10% of area localized damage.

ROOF TILES

13. Each tile is considered individually. However, since the removal of an individual roof tile is impractical, the aim of the assessment should be to determine whether to carry out an overall removal or not. In assessing the condition of the roof tiles, the overall percentage of damaged tiles should be worked out and an assessment made using the following criteria :-

Satisfactory : 15% of area damage or less (major cracks or chipping).

Poor : >15% of area damage (major cracks or chipping).

REFUSE CHUTE

14. Refuse chutes are assessed on a floor by floor basis. The assessment guidelines are as follows :-

Satisfactory : No visible damage (major cracks or chipping) or deterioration, OR damage (major cracks or chipping) up to 5% of area of the surface if scattered or up to 10% of area if localized.

Poor : Damage (e.g. chipping) >5% of area of the surface if scattered or >10% of area if localized or any major crack.

CEMENT PIPES

15. Cement pipes (or rainwater pipes) are assessed on a floor by floor basis both at public areas such as corridor or staircase landings and inside occupied flats. The assessment guidelines are as follows :-

Satisfactory : No visible damage (major cracks or holes or rusting) OR damage (major cracks or chipping) up to 5% of area of the surface of that run of the pipe if scattered or up to 10% of area if localized.

Poor : Damage (e.g. chipping) >5% of area of the surface of that run of the pipe if scattered or >10% of area if localized or any major crack.

CHIMNEY

16. Every section of the chimney body is surveyed if applicable. In general the bottom section of the chimney starts at the restaurant kitchen level. As the restaurant is taken as a high activity area, damage inflicted by human factors would be very probable. The ending section of the chimney is usually at the roof area of the building. This section of the chimney is of low human disturbance and damage by means of natural causes such as weathering is more likely.

17. The middle or traverse areas of the chimney are usually enclosed in the building structure or enclosed by features such as ducting. These sections of the chimney normally receive low or no disturbances of any kind and if deemed inaccessible, the bottom and top section should be representative enough of the whole chimney for the purpose of condition surveillance.

18. The chimney should be assessed using the following criteria :-

Satisfactory : No visible damage (major cracks or holes or rusting) OR damage up to 5% of area of the surface if scattered or up to 10% of area if localized.

Poor : Damage (major cracks or holes or rusting) >5% of area of the surface if scattered or >10% of area if localized.

OTHER ELEMENTS

19. All other ACMs should be assessed on an **% of area** basis. The assessment guidelines are as follows :-

Satisfactory : No visible damage or deterioration OR damage up to 5% of area of the surface if scattered or up to 10% of area if localized.

Poor : Damage >5% of area of the surface if scattered or >10% of area if localized.

4.0 MAINTENANCE WORKS

4.1 Responsibilities

BUILDING WORKS

1. SMS/R&D
 - to provide MS/PSA with ACM information where necessary.
 - to give advice on abatement method guidelines and air monitoring strategy.
 - to give advice on preparation of Particular Specification on asbestos abatement.
 - to attend pre-work meeting.
 - to carry out technical audit inspections.
 - to keep record of Registered Asbestos Contractor's performance reports.
 - to take over special asbestos abatement works from the MS as may be required.
2. MS
 - to arrange for asbestos abatement works.
 - to notify EPD of asbestos abatement works in standard form
 - to arrange for bulk sampling of suspected ACM.
 - to hold pre-work meetings for asbestos abatement works.
 - to monitor asbestos abatement works.
 - to compile Registered Asbestos Contractors' performance reports for submission to SMS/R&D.
3. SCW
 - to assist MS in the inspection of asbestos abatement works.
 - to attend emergency Work Request from Estate Management Office regarding asbestos contamination.

BUILDING SERVICES

4. CTO(BS)/TD
 - to give advice on abatement method guidelines and air monitoring strategy.
 - to give advice on preparation of particular Specification on asbestos abatement.
 - to attend pre-work meeting.
 - to carry out technical audit inspections.
 - to coordinate Registered Asbestos Contractors' performance reports and provide such reports to SMS/R&D.
 - to take over special asbestos works from BSE as may be required.
5. BSE
 - to arrange bulk sampling of suspected ACM.
 - to arrange for asbestos abatement works.
 - to notify EPD of asbestos works in standard form.
 - to hold pre-work meetings for asbestos works.
 - to monitor asbestos works.
 - to compile Registered Asbestos Contractors' performance reports for submission to SMS/R&D through CTO(BS)/TD.
6. SBSI
 - to assist BSE in the inspection of asbestos works.
 - to attend emergency Work Request from Estate Management Office regarding asbestos contamination in building services installation.

4.2 PLANNING

INTRODUCTION

1. The MS initiates and monitors asbestos abatement work in accordance with the asbestos abatement programme. In addition the abatement of individual ACM elements are initiated, regardless of whether they are included in the programme or not, if they become defective and require abatement without delay.
2. The BSE initiates and monitors asbestos abatement work whenever friable ACM is found in building services installations that requires abatement.
3. The Project Professional for asbestos works shall check whether the works belong to the list of exempted works in Section 6.8, which determine the need to engage a Registered Asbestos Consultant/Contractor.
4. The procedures for the engagement of a Registered Asbestos Consultant for Maintenance works are described in paragraph 25-27.
5. Exempted works shall be carried out in accordance with the Asbestos Management (EMDTG07) and supporting documents. Non-exempted classes of works shall be carried out according to the Asbestos Abatement Plan prepared by a Registered Asbestos Consultant and accepted by EPD.
6. The procurement of Registered Asbestos Contractor services may be arranged by means of separate lump sum contracts, quotations etc. depending on the nature, scale and urgency of the works.
7. The MS/BSE selects the appropriate procurement method and prepares for the works as set out below for each contract type. The MS/BSE seeks advice from SMS/R&D or CTO(BS)/TD as appropriate, for the detail preparation of the documentation.
8. If no work method guideline is suitable for the asbestos job, the MS/BSE should consult SMS/R&D or CTO(BS)/TD as appropriate, for advice. Where the works are of a special nature they may be taken over by SMS/R&D or CTO(BS)/TD as appropriate.
9. If details of the type(s) of asbestos are not available in the Central record, the MS/BSE arranges for bulk sampling tests in accordance with Section 5.6.

GUIDELINES/SAMPLE SPECIFICATIONS

10. Guidelines for works procurement are set out in the Appendices and sample specifications and work methods are set out in the Asbestos Technical Guidelines, EMDTG08.

11. Where guidance on the preparation of the particular specification is included in a sample document it is enclosed in brackets and identified. All guidance notes must be deleted from the final printout of the particular specification.
12. Copies of the sample documents and specifications contained in EMDTG08 may be obtained in electronic and hardcopy form from QMU/M.

LUMP SUM CONTRACTS

13. A lump sum contract may be arranged if the cost of the asbestos job together with any necessary builder's work is high and suitable work method guidelines are described in EMDTG08. In this situation the Registered Asbestos Contractor is a subcontractor to the general contractor.
14. The contract documents are prepared in accordance with the Estate Management Division (EMD)'s Contract Procedures manuals, and with the specific requirements for asbestos works included as part of the Particular Specification as described in the Appendices.

QUOTATIONS

15. The most common procurement arrangement is to use a quotation.
16. The quotation documents are prepared in accordance with the EMD's Contract Procedures manuals and with the specific requirements for asbestos works included as part of the Quotation Terms as described in the Appendices.

DOCUMENTATION/NOTIFICATION REQUIREMENTS

17. There are a number of requirements both statutory and from Housing Department for contractors involved in asbestos abatement works to give prior notice to other Government Departments and to maintain specific records relating to the works. These are set out below for each of the Departments concerned.

ENVIRONMENTAL PROTECTION DEPARTMENT (EPD)

18. At least 28 days before commencement of asbestos removal works, the MS/BSE shall notify EPD using the standard form ([EMDTG07-F12](#)) at section 5 giving details of location, planned commencement and completion dates of asbestos removal, type of ACM, and project contact officer's telephone number. A copy of the prescribed form shall be forwarded to SMS/R&D or CTO(BS)/TD as appropriate.

19. The contractor is required to apply for a waste disposal trip ticket for the disposal of asbestos waste generated from the asbestos abatement work well ahead of time. The application for this trip ticket should be kept on-site for inspection.
20. Maintenance records for any HEPA equipment must be kept on-site.

LABOUR DEPARTMENT

21. It is a statutory requirement that the contractor should give notification to the Labour Department 28 days before the commencement of asbestos abatement work. The notification is done through a prescribed form and a copy should be kept on-site.
22. All asbestos workers must have valid and up-to-date medical certificates.
23. Where special construction or equipment such as scaffolding or hoists are used as part of the asbestos abatement work, the relevant certificates or inspection reports must be available on-site.

HOUSING DEPARTMENT

24. The contractors are required to keep a complete list of the workers and site supervisor, including their I.D. numbers and an organization chart on-site for inspection.

PROCEDURE FOR ENGAGEMENT OF A REGISTERED ASBESTOS CONSULTANT

25. This procedure describes the arrangements to be followed for the engagement of a Registered Asbestos Consultant for Maintenance works.
26. For planned jobs the Project Professional obtains the latest list of registered asbestos contractors/consultants through EPD's website. (Note: For the asbestos abatement work of non-exempted classes of work, it is recommended that the registered asbestos contractor shall engage at their own cost the said consultant for periodic supervision and certification of completion of works).
27. The Project Professional should give 28 days notice to EDP in the prescribed form at Section 5.8 before commencement of the asbestos work.
 - a) Emergency repairs to underground asbestos cement watermains shall follow the procedures stipulated in Estate Management Division Instruction No. W01/2014.

4.3 MANAGEMENT

INTRODUCTION

1. In the management of asbestos abatement works the MS/BSE/PSA and their site staff closely monitor the works to ensure that the Registered Asbestos Contractor complies with the regulations and the specified requirements. This includes :
 - a) requiring the contractor to obtain approval prior to the commencement of the works, or any zone of the works.
 - b) air monitoring testing before during and after the works.
 - c) the maintenance of a daily log by EMD staff.
 - d) inspection to ensure that the contractor adheres to the approved work method/Asbestos Abatement Plan.
 - e) inspecting the works on completion of any zone.
 - f) requiring the contractor to obtain approval prior to removing any containment or segregation.
 - g) requiring the contractor to prepare emergency measures.
 - h) technical audit of the works by SMS/R&D or CTO(BS)/TD.
 - i) reporting on the contractor's performance on completion of the works.

PRE-WORK MEETING

2. A pre-work meeting is arranged by the MS/BSE/PSA and consists of the MS/BSE/PSA and site staff, SMS/R&D's representative or CTO(BS)/TD as appropriate, the Registered Asbestos Contractor and site supervisor, the main contractor, the Registered Asbestos Laboratory representative, the affected occupiers' representatives and a representative from EMD.
3. The MS/BSE/PSA prepares Form [EMDTG07-F06](#) and submits it together with the required information to SMS/R&D or CTO(BS)/TD respectively at least one week before the pre-work meeting.
4. The purpose of the pre-work meeting is to :
 - (a) ensure that all parties understand the work method;
 - (b) confirm the programme and zoning arrangements;
 - (c) scrutinise the contractor's submission on the proposed site supervisor and the equipment and its maintenance records;
 - (d) confirm the air monitoring strategy and schedule including arrangement of background air monitoring;
 - (e) confirm the site set-up and location of the secure store or storage skip; and

- (f) issue the necessary forms to the Registered Asbestos Contractor for his use.

AIR MONITORING

5. Air monitoring is crucial to the management of asbestos abatement works. Before commencement of any preparation work on site, background air tests are carried out. Environmental/leakage and personal air monitoring tests are carried out during asbestos removal work and penultimate, clearance or reassurance air monitoring tests on completion of the works as appropriate. An air monitoring strategy is included in each of the BW work method guidelines, and CTO(BS)/TD provides the required air monitoring strategy for BS.
6. Requests for air monitoring tests are made to SCE/MTM (tel.2728 3992) using Form DCMM-F03.This Form can be downloaded from HKHA's Intranet.

COMMENCEMENT OF ASBESTOS REMOVAL WORK

7. Having completed the necessary preparation work, the Registered Asbestos Contractor is required to request approval to commence work on Form [EMDTG07-F07](#), Request for Approval to Commence Work. The contractor completes Part A of the form and submits the form to the MS/BSE/PSA.
8. The MS/BSE completes Part B of Form [EMDTG07-F07](#) to either give approval to commence work or to indicate any checklist item not in order and require the contractor to re-submit. The forms are filed on the project file.

INSPECTION REQUEST ON COMPLETION OF ZONE

9. On completion of the asbestos removal of one zone, the contractor is required to request an inspection of the zone on Form [EMDTG07-F08](#), Request for Inspection. The contractor completes Part A of the form and submits the form to the MS/BSE/PSA after receiving the penultimate air test results from the testing contractor. The final clearance air test or reassurance air test for the zone may only be carried out after approval is given by the MS/BSE/PSA.
10. After receiving satisfactory clearance/reassurance air test results of the zone, the contractor completes Part B of the form and submits the form to the MS/BSE/PSA for approval to commence the next zone, if there is more than one zone.
11. On completion of the asbestos removal works the contractor completes Part C of the form and submits the form to the MS/BSE/PSA for approval to remove the containment/segregation for the zone. The forms are filed on the project file.
12. If the contractor removes a containment/segregation before obtaining approval the MS/BSE/PSA instructs them to carry out appropriate remedial measures, including reinstatement and cleaning, before resubmitting the form.
13. The MS/BSE/PSA ensures that the asbestos waste is disposed of to the satisfaction of EPD.

DAILY LOG

14. The MS/BSE/PSA maintains a daily log of the asbestos abatement works on Form [EMDTG07-F09](#). The check list is a guideline only and only the non-compliances are to be recorded. This form is used as an aid to the assessment of the contractor's performance and the lower part of the form shall be kept on the project file.

AIR MONITORING TEST RESULTS

15. The laboratory is required to fax the air monitoring test results to the MS/BSE/PSA within 4 hours of a test or before 9 a.m. the next morning.
16. The MS/BSE/PSA checks the results against the air monitoring control limits at Section 6.5, Air Monitoring, and takes action as necessary in accordance with the work method and the emergency measures.
17. The laboratory is required to compile a weekly summary of air monitoring test results using Form [EMDTG07-F10](#) and submit the form to the Project Officer each week.
18. If the duration of the removal work is less than one week (e.g. removal of the lagging on a generator flue) one form is used on completion of the work.

MONITORING OF THE WORKS

19. The MS/BSE/PSA and site staff monitor the works to ensure that they are carried out in accordance with the statutory requirements and the approved work method.
20. A Registered Asbestos Supervisor is required to be on-site full time. Whenever asbestos work or asbestos work related activities are being carried out (such as site cleaning and constructing containment) supervision of the works must be provided by the Registered Asbestos Contractor's Registered asbestos Supervisor. This is a mandatory requirement and deviation from this is considered a serious offence.
21. The contractor is required to follow the approved method statement meticulously. Any request for deviation must be submitted to the project professional officer in writing for approval.
22. Upon leaving the site at the end of a work day, all power and water supply must be switched off. However, in the cases where a containment is used, the air mover is required to be switched on 24 hours a day and hence electricity supply must be kept going for this purpose.
23. Where the power supply to a containment must be switched off until the next working day, all the openings of the containment must be sealed up before the air mover is switched off. The air mover must be switched on before the sealed openings are re-opened on the next working day.
24. Detailed inspection guidelines set out in the Appendices.

EMERGENCY MEASURES

25. The MS/BSE/PSA and site staff ensure that the contractor carries out the appropriate emergency measures if any of the following situations arise during the course of asbestos removal works :
- (a) Spillage of asbestos contaminated debris outside the work area;
 - (b) The environmental control limit is exceeded;
 - (c) A fire breaks out in or near the work area;
 - (d) A worker collapses or occurrence of an accident; or
 - (e) Number 3 typhoon signal (or above) is raised or a rain storm warning is given.
26. Where either the leakage or Personal samples or both have exceeded the required limit during a short duration job (one day), the site staff instruct the contractor to carry out necessary clean-up at appropriate locations.
27. Where either the leakage or Personal samples or both have exceeded the required limit and the abatement work has not been completed at the time of receiving the results, the site staff ensure that the contractor carries out the appropriate emergency measures.
28. In all cases site staff check thoroughly that the contractor has followed the approved method statement meticulously and report to the MS/BSE/PSA as appropriate.
29. The emergency measures that the contractor is required to follow are included in the contract documents. Refer to EMDTG07-5.7, EMERGENCY PROCEDURES.

TECHNICAL AUDIT INSPECTION

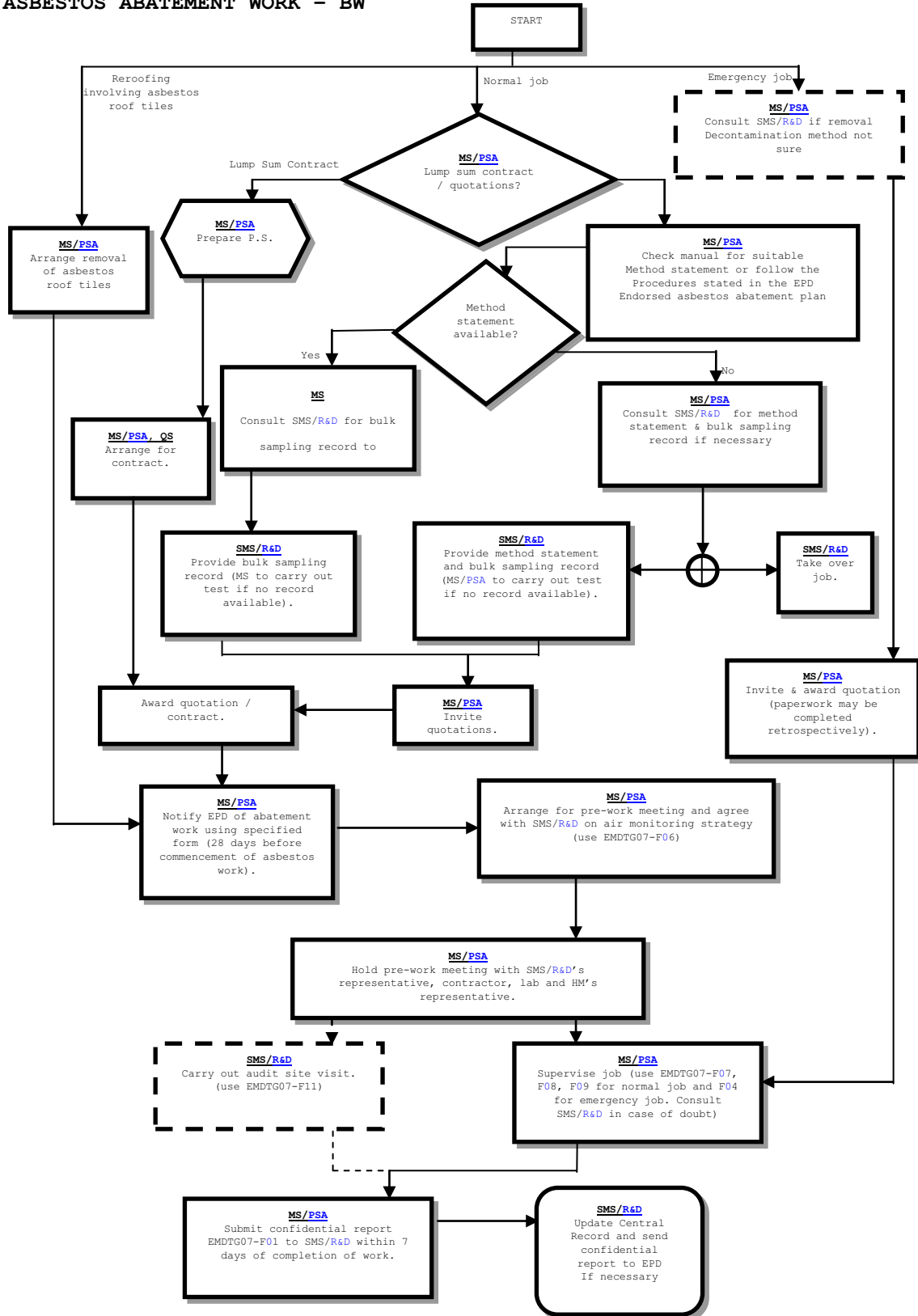
30. SMS/R&D or CTO(BS)/TD or their representatives as appropriate carry out random technical audit inspections of asbestos abatement works. The inspection reports are recorded on Form [EMDTG07-F11](#) and a copy is sent to the MS/BSE/PSA in charge of the project.

REPORT ON PERFORMANCE OF SPECIALIST ASBESTOS REMOVAL CONTRACTOR

31. On the completion of an asbestos abatement project, the MS/BSE/PSA in charge of the project completes a report on the performance of the specialist contractor, using Form [EMDTG07-F01](#).
32. Refer to Section 3.4, Registered Asbestos Consultants, Contractors, supervisors & Laboratories.

4.4 Flow Charts

ASBESTOS ABATEMENT WORK - BW



4.5 Squatter Structures (Deleted)

GENERAL

1. For demolition of squatter structures suspected of containing asbestos, the squatter control staff liaise with the relevant MS to arrange a joint site visit with a view to ascertaining whether ACM are present. As soon as ACM are confirmed by laboratory analysis, the HM is notified of the test results.
2. The HM will request the MS to remove the ACM by sending a memo with details such as location, dimensions etc. and funding arrangement. The MS shall then arrange the asbestos abatement work following proper procedures, and send a performance report on the registered asbestos contractor to SMS/R&D upon completion of work. After the removal of the ACM, the remaining structure is removed by the Squatter Control Section.

5.0 MISCELLANEOUS**5.1 Abbreviations****ABBREVIATION****A**

A	-	Architect
ACM	-	Asbestos Containing Material
Arch. S.D.	-	Architectural Services Department
AWG	-	Asbestos Working Group

B

BS	-	Building Services
BSE	-	Building Services Engineer
BW	-	Building Works

C

CM	-	Contract Manager (see SO)
CM/M	-	Chief Manager/Management
CSE	-	Chief Structural Engineer
CTO	-	Chief Technical Officer

D

DMO	-	District Maintenance Office
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E

EPD	-	Environmental Protection Department
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H

HD	-	Housing Department
HEPA	-	High Efficiency Particulate Air
HM	-	Housing Manager

L

LD	-	Labour Department
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M

EMD	-	Estate Management Division
MS	-	Maintenance Surveyor

P

PO	-	Project Officer
PSA	-	Property Services Agent
PVA	-	Polyvinyl Acetate

ABBREVIATION

Q

QA - Quality Assurance

S

SBSI - Senior Building Services Inspector

SCW - Senior Clerk of Works

SE - Structural Engineer

SMS - Senior Maintenance Surveyor

SO - Supervising Officer (in Specification means Contract Manager)

SSE - Senior Structural Engineer

5.2 SIGNIFICANCE OF ASBESTOS

THE ORIGIN AND NATURE OF ASBESTOS

1. Asbestos occurs naturally in many parts of the world; the main sites of commercial production are in Canada, the Russian Federation and South Africa. 'Asbestos' is a generic term for the fibrous forms of several mineral silicates. These occur naturally in seams or veins, in many igneous or metamorphic rocks and belong to one of two large groups of rock-forming minerals : the serpentines and the amphiboles.
2. The three main types of asbestos produced commercially are :

Chrysotile - white asbestos
Crocidolite - blue asbestos
Amosite - brown asbestos
3. The serpentine group contains chrysotile, which is the only asbestos form member of this group of minerals and by far the commonest and commercially the most important type of asbestos.
4. The amphibole group contains crocidolite and amosite and also anthophyllite, actinolite and tremolite. Amosite is an acronym for Asbestos Mines of South Africa and is mineralogically known as cummingtonite - grunnerite asbestos. Tremolite may occur as a contaminant with chrysotile and with other minerals such as vermiculite.
5. Asbestos-containing rock is crushed and milled at the mining site to produce raw asbestos of various grades. Asbestos fibre is incombustible and mechanically strong and the different types are also, in different degrees, resistant to high temperatures, electric current and alkalis and efficient at absorbing sound. Only the amphibole fibres are resistant to acids. Because of its fibrous nature, it can be woven into fabrics and used as reinforcement for cement and plastics.

ASBESTOS RELATED DISEASES

6. The principal diseases known to be caused by exposure to asbestos are asbestosis, lung cancer and malignant mesothelioma.

Asbestosis : Fibrosis or scarring of the lung in which the tissue becomes less elastic making breathing progressively more difficult. It is irreversible and may progress even after cessation of exposure to asbestos. Asbestosis is an industrial disease arising from high levels of exposure to airborne dust and there is little risk of contracting this disease from normal levels of environmental exposure to asbestos.

- Lung cancer : An increased incidence of lung cancer has been found amongst people who work with asbestos. The incidence is dependent on the degree of exposure and is very much greater for smokers than for non-smokers. All three types of commonly-used asbestos fibre can cause lung cancer, but crocidolite and amosite are thought to be more dangerous than chrysotile.
- Mesothelioma : A cancer of the inner lining of the chest or of the abdominal wall. The incidence in the general population is very low and most cases are attributable to working with asbestos. Crocidolite and probably amosite are much more likely to cause mesothelioma than chrysotile asbestos.

EXPOSURE, LATENCY, FIBRE SIZE

7. The risk of contracting an asbestos related disease depends on a number of factors, including the cumulative dose to which an individual has been exposed, the time since first exposure and the type and size of the asbestos fibres. It is generally assumed that the risk of cancer is proportional to total exposure. There is commonly a lag or latency period of 10-20 years between first exposure and onset of symptoms for asbestos related diseases and, in the case of cancer, the period of latency may be up to 40 years or more.
8. Fibre size and shape are thought to be important variables in determining the risk from asbestos. Longer fibres with a length of greater than 200 microns are generally cleared from the nasal passages, but shorter fibres with a diameter of less than about 2 microns may penetrate deep into the lungs.
9. Laboratory evidence suggests that the hazard is greatest with fibres between 5 and 10 microns in length and 1.5 or 2 microns in diameter. There are, however, no clear boundaries between hazardous and non-hazardous configurations.

PUBLIC HEALTH EFFECTS

10. Most of the information of the health effects of exposure to asbestos has been derived from studies of workers occupationally exposed to asbestos fibres at concentrations many times higher than those encountered by the general public. Estimates of the risk of low level exposure have to be based on extrapolation from occupational exposure levels, and the range of uncertainty in such estimates is large.

11. The risk of mesothelioma is thought to increase rapidly with time since first exposure and it is therefore likely that children will be more at risk than adults from a similar exposure. Smoking and asbestos appear to act synergistically in causing lung cancer, and smokers exposed to asbestos have a much greater additional risk of contracting lung cancer than non-smokers similarly exposed.
12. There is no known threshold level for exposure to asbestos below which there is no risk and it is advisable to reduce exposure to the minimum that is reasonably practicable. In cases where there is potential for long periods of exposure, as in homes, or where children are involved, as in schools, particular efforts should be made to ensure that the levels are as low as possible.

ASBESTOS IN DRINKING WATER

13. The UK Committee on Medical Aspects of the Contamination of Air, Soil and Water, advising on the implications for public health of the use of asbestos cement pipes in drinking water distribution systems, concluded that :
14. "The only potential risk from the presence of asbestos in drinking water which has been suggested as at all plausible, is that of certain forms of cancer. The Committee has considered the substantial body of research findings relevant to this question; it has found no convincing evidence which indicates that the concentrations and forms of asbestos in drinking water in the UK, including those derived from the use of asbestos-cement pipes according to current practice, represent a hazard to the health of the consumer. The information assessed by this Committee suggests that, if there is any carcinogenic risk to the consumer from exposure to asbestos in drinking water, it is of an extremely low order and is not detectable by the methods currently available."
15. The report of the Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment states that studies have generally yielded negative results and that there is no clear epidemiological evidence of increased carcinoma in the gastrointestinal tract attributable to asbestos in non-occupationally exposed populations.

5.3 SIGNIFICANCE OF ASBESTOS

1. Relevant information on the subject can be found in the following legislations and publications :
 - (a) Factories and Industrial Undertakings (Asbestos) Regulation (Cap. 59AD). The regulation was made under the Factories and Industrial Undertakings Ordinance (Cap. 59).
 - (b) Pneumoconiosis and Mesothelioma (Compensation) Ordinance (Cap. 360).
 - (c) Occupational Safety and Health Ordinance (Cap. 509)
 - (d) Occupational Safety and Health Regulation (Cap. 509A)
 - (e) The Air Pollution Control Ordinance (Cap. 311).
 - (f) The Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). The regulation is made under the Waste Disposal Ordinance (Cap. 354).
 - (g) Code of Practice: Safety and Health at Work with Asbestos published by LD.
 - (h) Health Hazards of Asbestos published by LD.
 - (i) 5 sets of Code of Practice on Asbestos Control published by EPD :-
 - Handling, Transportation and Disposal of Asbestos Waste;
 - Preparation of Asbestos Investigation Report, Asbestos Management Plan and Asbestos Abatement Plan;
 - Asbestos Work Using Full Containment or Mini Containment Method;
 - Safe Handling of Low Risk Asbestos Containing Material; and
 - Asbestos Work Using Glove Bag Method.
 - (j) 4 leaflets published by EPD :-
 - Environmental Asbestos Control;
 - Asbestos Removal of Unauthorized Building Works;
 - How to Handle Corrugated Asbestos Cement Sheets; and
 - Banning Asbestos.
 - (k) Practice Note 2/97 Handling of Asbestos Containing Materials in Buildings issued by the Professional Persons Environmental Consultative Committee.
 - (l) Code of Practice for Demolition of Buildings published by the Buildings Department.

- (m) Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers - ADV-1 "Asbestos" issued by the Buildings Department.
- (n) Practice Note for Registered Contractors - PNRC 15 "Asbestos" issued by the Buildings Department.

5.4 Air Monitoring Control Limits

GENERAL

1. Air monitoring is carried out to ensure that there is no contamination of the surrounding environment or increase in risk to any person as a result of asbestos abatement works.
2. The air monitoring standards that are applied to all asbestos abatement works in accordance with the local legislation and accepted international standards are set out below.

BACKGROUND LEVEL

3. Background sampling is conducted to determine the ambient fibre level prior to the commencement of abatement work and to detect any change in it resulting from the works.
4. There is no standard level for a background sample, however unless there are other sources of fibre generation in the vicinity of the work site that cannot be isolated or removed, the 0.01 fibre/mL level is imposed.

OCCUPATIONAL EXPOSURE LIMITS

5. Personal sampling is conducted for the protection of workers during the process of asbestos abatement works.
6. The occupational exposure limits should not exceed :
 - 0.2 fibre/mL for crocidolite and amosite
 - 0.5 fibre/mL for other forms of asbestos
7. In practice some form of respiratory protection is essential and the equipment used must be that which is appropriate for the dust levels involved.

LEAKAGE (DURING ABATEMENT) CONTROL STANDARD

8. Leakage sampling is conducted adjacent to the site where asbestos abatement works is being carried out to ensure that there is no contamination of the surrounding environment during the course of the works.
9. The dust level adjacent to the sites where asbestos abatement works is being carried out should not exceed 0.01 fibre/mL or be significantly different from the background level, whichever is higher.

PENULTIMATE/FINAL CLEARANCE STANDARD

10. Penultimate and final clearance sampling is conducted to ensure that the site is safe for re-occupation after asbestos abatement works have been carried out by the containment or mini-containment method.

11. The fibre count upon completion of abatement works should not exceed 0.01 fibre/mL or be higher than the original background level and no visible debris be apparent.

REASSURANCE STANDARD

12. Reassurance sampling is conducted to ensure that the site is safe for re-occupation after asbestos abatement works have been carried out by a method other than containment or mini-containment.
13. A reassurance sample is acceptable if it is below 0.01 fibre/mL, or is not greater than original background sampling results.

5.5 Asbestos Working Group Terms of Reference

MEMBERSHIP

1. The membership of the Asbestos Working Group (AWG) is as follows :-

Chairman	CM/M (PM)
Members	SMS/R&D SSE/15 SE/122 SE/SIS3 CTO (BS)/TD HM/BPS2
Secretary	MS/ENV

Representative from :

Environmental Protection Department.
Labour Department

TERMS OF REFERENCE

2. - to advise the Permanent Secretary of Housing on the continued development of an asbestos abatement strategy;
- to receive and consider information on materials containing asbestos in Housing Authority managed property;
- to receive and consider information on the Housing Department's asbestos abatement programmes;
- to keep under review the Housing Department procedures for removal or encapsulation of materials containing asbestos, and to provide advice to the Housing Department on these procedures to ensure standards of asbestos abatement are appropriate for the level of risk;
- to receive and consider information of the performance of asbestos abatement contractors and consultants undertaking work for the Housing Department, and the results of associated routine air monitoring.

FREQUENCY OF MEETINGS

3. Meetings are held [annually](#).

FILE REFERENCE

4. [HD3-4/RD/-9/3](#)

5.6 Bulk Sampling

GENERAL

1. The purpose of these guidelines for bulk sampling is to enable staff to produce representative sampling strategies for materials suspected of containing asbestos. The basic principles of bulk sampling are :
 - to obtain representative samples of the suspected asbestos-containing materials (ACM), and
 - to draw inference from the samples collected about the overall ACM, stating clearly the statistical validity of such inference.
2. Sampling guidelines are set out below for each type of ACM.

SURFACE MATERIAL

3. Surface material includes ACM used as surface finishing such as acoustic plaster and asbestos paint. If asbestos is suspected in surfacing material, a full depth approach should be adopted.
4. Sampling guideline for surface material.

Homogeneous Area	No. of samples
50 m ² or less	3 (only analyse the second and third sample if the result of the first is negative)
for each additional area up to 100 ²	1 further sample
for an area larger than 500m ²	at least 5 in total

5. Sample should be taken to full depth with dimension of 25mm x 25mm.

CEMENTITIOUS MATERIAL

6. Cementitious material includes asbestos segregation boards, corrugated sheets, asbestos roof tiles, grille panels, asbestos cement pipes and all other cementitious suspected ACM. Sample size should have a minimum dimension of 25mm x 25mm.
7. Sampling guideline for cementitious material.

Homogeneous Area	No. of samples
100m ² of less	2 (only analyse the second sample if the result of the first is negative)
for each additional area up to 100m ²	1 further sample
for an area larger than 700m ²	at least 5 in total

8. Sample should have a minimum size of 25mm x 25mm.

RESINATED MATERIAL

9. Resinated material includes materials such as gaskets, caulking material, pump packing, lift brake lining, brake shoe, fire damper of busbar riser, arc chute of switch gear and vinyl floor tiles.
10. Two samples shall be taken for each type of material located at a single location. (for cases where it is impractical to obtain sample from the installation which is in operation, relevant contractor shall provide sample of the same material for analysis, such as lift brake lining). The second sample should be analysed only if the first is negative.
11. Sample should be equivalent to a volume dimension of 25mm x 25mm x 10mm.

WOVEN MATERIAL

12. Woven material includes suspected woven ACM used as flexible joints, fire blankets, and fire curtain.
13. Two samples shall be taken for each type of material located at a single location. (For cases where it is impractical to obtain sample from the installation which is in operation, relevant contractor shall provide sample of the same material for analysis if available). The second sample should be analysed only if the first is negative.
14. Sample should have a minimum dimension of 25mm x 25mm.

INSULATION MATERIAL

15. Insulation material includes materials such as switch gear arc chutes, insulation boards, pipe/flue/rope/chimney lagging, refuse chutes, sandwiched chimney insulation material and air duct insulating material.
16. Sampling guideline for insulation material in the form of lagging.

Homogeneous run	No. of samples
10m in length/50m ² or less	3 (only analyse the second and third sample if the result of the first is negative)
for each additional length up to 5m or additional area up to 100m ²	1 further sample
for a total length longer than 50m or larger than 200m ²	at least 5 in total

17. For other insulation material, 2 samples shall be taken for each type of material located at a single location. (For cases where it is impractical to obtain sample from the installation which is in operation, relevant contractor shall provide sample of the same material for analysis if available). The second sample should be analysed only if the first is negative.

CONNECTING PARTS

18. Connecting parts includes installations such as elbows, flanges and valves.
19. 2 samples shall be taken for each type of installation items located at a single location. The second sample should be analysed only if the first is negative.
20. Sample should have a minimum dimension of 25mm x 25mm.

REQUEST FOR TESTING SERVICES

21. Bulk sampling is carried out through the Department's materials testing services, and requests for bulk sampling are made to SCE/MTM using Form DCMM-F03. This form can be downloaded from HKHA's Intranet

5.7 Emergency Procedures

ASBESTOS CONTAMINATION

1. If Management staff or PSA identify a case of asbestos contamination, they should immediately fence off the contaminated area, erect warning signs and arrange a guard to patrol if necessary. They should advise any person who has touched the contamination to wash their hands, hair and face, or to take a thorough shower as soon as practicable.
2. The appropriate DMO should be notified of the case by an Urgent Works Request from the HM/PSA.
3. As soon as possible after receiving the notice the MS/BSE or SCW/SBSI conducts an inspection to verify the asbestos contamination and arranges for decontamination of the contaminated area by an Registered Asbestos Contractor. The associated paperwork for award of quotation, issue of Works Order and notification to EPD may be dealt with retrospectively. For emergency repairs to underground asbestos cement water mains, the procedures stated in EMDI No.W01/2014 shall be followed.
4. If the MS/BSE/PSA is not sure of the decontamination method or the contamination is widespread, SMS/R&D or CTO(BS)/TD should be consulted.
5. The site staff monitor the works and maintain a record using the DAILY LOG Form [EMDTG07-F09](#).
6. Within one week of the completion of the works the MS/BSE/PSA submits a report on the registered asbestos contractor's performance to SMS/R&D for processing in the normal manner. Refer to Section 3.4
7. Any subsequent asbestos work following the decontamination work is dealt with according to the procedures for Planned works.

PROCEDURES IN THE CASE OF A SPILLAGE OF DEBRIS

8. If during the course of Asbestos Abatement work Asbestos contaminated debris is spilled outside the Work Area, staff ensure that the registered asbestos contractor immediately carries out the following :-
 - a) Segregate the contaminated area and post warning signs.
 - b) Stop all processes which would result in producing more asbestos debris.
 - c) Spray all the suspected contaminated surfaces and debris within the Work Area with Amended Water in a fine mist spray, using airless spray equipment.
 - d) Bag all loose asbestos materials/debris which are present in the Work Area.
 - e) Wet-wipe clean the surfaces and thoroughly clean the contaminated area with a HEPA vacuum cleaner once the surfaces become dry. Prepare the site for visual inspection by the SO, who shall verify by visual inspection and/or air testing that

the above measures have been carried out satisfactorily, before works are allowed to proceed.

Approved full-face positive-pressure powered respirators should be worn by workers carrying out the above.

PROCEDURES IF THE ENVIRONMENTAL CONTROL LIMIT IS EXCEEDED

9. If during the course of Asbestos Abatement work air monitoring results show that the Environmental Control Limit of 0.01 fibres/mL has been exceeded, staff ensure that the Contractor immediately carries out the following :-

- a) Stop all processes which would result in producing more asbestos debris.
- b) Spray all surfaces and debris within the Work Area with Amended Water in a fine mist spray, using airless spray equipment.
- c) Bag all loose asbestos materials/debris present in the Work Area(s).
- d) Investigate together with the SO the source of dust, the integrity of the Containment and the work procedures to identify the causes; and take immediate measures to rectify the situation as agreed by the SO.

Approved full-face positive-pressure powered respirators should be worn by workers carrying out the above.

PROCEDURES TO ADOPT AFTER A FIRE

10. If during the course of Asbestos Abatement work a fire has occurred and has been put out, staff ensure that the Contractor immediately carries out the following :-

- a) Spray all surfaces and debris within the Work Area with Amended Water in a fine mist spray, using airless spray equipment, once the fire has been extinguished and the site is safe for re-entry.
- b) Bag all loose asbestos materials/debris which are present in the Work Area.
- c) Wipe clean the surfaces and thoroughly clean the contaminated area with a HEPA vacuum cleaner once the surfaces become dry. Prepare the site for visual inspection by the SO, who shall verify by visual inspection and/or air testing that the above measures have been carried out satisfactorily, before works are allowed to proceed.

Approved full-face positive-pressure powered respirators should be worn by workers carrying out the above.

PROCEDURES IF A NUMBER THREE TYPHOON SIGNAL (OR ABOVE) IS RAISED OR WHEN THE RAIN STORM WARNING IS GIVEN

11. If during the course of Asbestos Abatement work a Number Three Typhoon Signal (or above) is raised, or if the Red Rainstorm Warning Signal is given, staff ensure that the registered asbestos contractor immediately carries out the following :-
 - a) Stop all processes which would result in producing more asbestos debris.
 - b) Bag all loose asbestos materials/debris which are present in the Work Area and remove to the Secure Store.
 - c) Clean the contaminated area thoroughly with a HEPA vacuum cleaner. Cut off all power and water supplies and secure all loose equipment and materials against typhoon damage. Check the drainage system is not blocked within the site area to avoid flooding.
 - d) Move all bags of asbestos waste to the Secure Store.
 - e) Prepare the site for visual inspection by the SO, who shall verify that the above measures have been carried out satisfactorily, before workers leave the site.
12. The abatement works are allowed to recommence once the Number Three Typhoon Signal has been lowered or when the Red-Rainstorm Warning signal is of whichever is applicable and the SO has verified that any necessary cleaning up work and repairs to containments have been completed.

PROCEDURES IN THE CASE OF AN ACCIDENT

13. If during the course of Asbestos Abatement work a worker collapses or some other accident occurs, staff ensure that the registered asbestos contractor immediately carries out the following :-
 - a) Stop all work and if necessary remove worker or workers to safety.
 - b) If a worker has collapsed, remove his face mask. In other cases the face mask should be left in place. Carry out normal Emergency First Aid procedures.
 - c) Arrange for the worker to be taken to a Hospital. Personal decontamination should be carried out whenever possible.
 - d) If the worker has not been decontaminated, the rescue or medical personnel involved should be so informed so that they are aware that the workers' clothing are contaminated and take appropriate safety measures.
 - e) Clean any adjoining area contaminated during the emergency thoroughly with a HEPA vacuum cleaner. Prepare the site for visual inspection by the SO, who shall verify by visual inspection and/or air testing that the above measures have been carried out satisfactorily, before works are allowed to proceed.

5.8 Standard Forms

FORM NO.	TITLE/DESCRIPTION	LAST AMENDMENT DATE
EMDTG07-F01	Report on Performance of Registered Asbestos Contractor	17/07/2015
EMDTG07-F02	Report on Bulk Sample Test Results	17/07/2015
EMDTG07-F03	Sample memo to request : Medical Examination for HD Staff Engaged in the Inspection of Asbestos Abatement Works	17/07/2015
EMDTG07-F04	Condition Survey of Asbestos Containing Materials	17/07/2015
EMDTG07-F05	Report on Encapsulation of Asbestos Cement Balcony Grille Panels	17/07/2015
EMDTG07-F06	Information for Pre-work Meeting	17/07/2015
EMDTG07-F07	Request for Approval to Commence Work	15/05/2009
EMDTG07-F08	Request for Inspection	15/05/2009
EMDTG07-F09	Daily Log	15/05/2009
EMDTG07-F10	Air Monitoring Data Summary Sheet	15/05/2009
EMDTG07-F11	Technical Audit Inspection Report	17/07/2015
EMDTG07-F12	Notification of Commencement of Asbestos Abatement Work	15/05/2009

6.0 APPENDICES

6.1 Pre-works Check

GENERAL

1. This part of the site work involves three aspects :
 - a) Works area preparation;
 - b) Secure storage area preparation;
 - c) Availability of facilities;

WORKS AREA PREPARATION

2. Before the commencement of any containment/segregation construction work, the site must be properly prepared. This involves :
 - removing all removable items and storing them in a secure place (inaccessible by anyone not part of the work team);
 - cleaning thoroughly by wet-wiping with wet cloth and HEPA vacuuming to the extent that all visible dust particles or fibres are cleared; and
 - covering securely the non-removable items with 0.15mm thick polythene sheets (to avoid contamination).
3. All these must be properly and thoroughly done before the contractor should be allowed to proceed with building the containment or segregation.
4. Where asbestos is known to be present, any fibre that is unclassified will be treated as asbestos fibre to be on the safe side. Therefore, pre-site cleaning is not to be taken lightly especially when the asbestos-containing material is friable in nature.

SECURE STORAGE AREA PREPARATION

5. A secure storage area shall mean a fully segregated area that is lockable with access limited to those handling the asbestos waste. Appropriate warning signs must be put up in conspicuous locations to warn any potential trespassers that might pass by.
6. The secure storage area must be locked at all times except when waste is being placed in it or removed from it.
7. The secure storage area should ideally be located not too far away from the waste producing point, however, waste transporting through public areas must be kept to a minimum.
8. Should it be considered unavoidable to transport waste through public areas, the waste should be transported in sturdy carriers of an inconspicuous appearance. Additional precautionary measures will be required as approved by the Housing Department.

AVAILABILITY OF FACILITIES

9. Power and water supply on site must be checked and confirmed well ahead. Very often, these items would have to be provided for the contractor and time must be allowed to arrange for them.

6.2 Equipment Check

GENERAL

1. The inspection of equipment involves the following aspects :
 - a) availability of equipment
 - b) clean and free of debris
 - c) HEPA items
 - d) items for wetting ACM
 - e) containment/segregation items
 - f) personal protective items
 - g) waste disposal items
 - h) ACM removal items

AVAILABILITY OF EQUIPMENT

2. In the registered asbestos contractor's technical submission, an equipment list of all equipment and consumables the contractor proposed to use would be included. This list should form the basis of cross checking the equipment available on site. Any missing item(s) must be identified and be in place before any work can be carried out.

CLEAN AND FREE OF DEBRIS

3. As all dust and unclassified fibre will invariably be taken as asbestos, the equipment themselves must be clean and free of visible dust/fibre before they can be used in asbestos work procedures. Cleaning of the equipment can be done by either wet-wiping and or HEPA vacuuming.

HEPA ITEMS

4. HEPA (High Efficiency Particulate Air) items include the air movers, vacuum cleaners, and respirators. They are there to screen out asbestos dust/fibres effectively (capable of trapping and retaining 99.97% of the particles (asbestos fibres) greater than 0.3µm in mass median aerodynamic equivalent diameter).
5. With the air movers and the vacuum cleaners, the HEPA filters shall be installed in the maintenance workshop and the maintenance record kept on site for inspection when required. Hence, if the site staff are in any doubt as to the integrity of the HEPA filters in the equipment, the servicing record should be checked. The date of the record should also be checked to make sure it is the latest one.
6. The HEPA filter used in the respirators should be the replaceable cartridge type filters as approved under the Factories and Industrial Undertakings (Asbestos Approval of Respiratory Protective Equipment) Notice.
7. With effect from December 1998, HEPA-filtered appliances that are used in asbestos works should be tested by the HEPA Appliance

Testing Centre recognized by the Environmental Protection Department. Certificate would be issued to the appliances that have passed the tests stipulated on the Code of Practice on Asbestos Control. Certification for all such appliances in use should be kept on site to facilitate compliance inspections carried out by the Environmental Protection Department and the Housing Department.

ITEMS FOR WETTING ACM

8. Amended water must be available on site for wetting of the ACM before removal. Amended water means a water diluted wetting agent (chemically 50% polyoxyethylene ether + 50% polyoxyethylene ester).
9. A common commercial product that is widely acceptable is called 'Asbesto-wet' which is an American product. If there is any doubt, the product's specifications should be checked. If the composition matches with the chemical composition described above (sometimes a few volume percentages will be allocated to some sort of emulsion), then the product is considered acceptable.

CONTAINMENT/SEGREGATION ITEMS

10. A containment will consist of the following parts/items each of them must be checked to assess the overall integrity of the containment :-
 - a) 0.15mm thick polythene sheets; timber battens;
 - b) 50 to 70mm wide duct tape;
 - c) air mover for full containment/HEPA vacuum cleaner for mini containment;
 - d) viewing panels (made of clear acrylic sheets);
 - e) mirror (in the clean room for assisting the face fitting of respiratory equipment) :
 - f) shower equipment including shower head, basin, shampoo & soap, nail brush, etc., and water filtration system capable of filtering particles down to 5µm in suspension. The water supply should also be checked on the sufficiency and cleanliness of water source.
 - g) warning signs;
11. A segregation will consist of the following parts/items and each of them must be checked to assess the overall integrity of the segregation :-
 - a) plywood boards used for hoardings;
 - b) 0.15mm thick polythene sheets;
 - c) 50 to 70mm thick duct taps;
 - d) viewing panels (made of clear acrylic sheets);
 - e) mirror (in the clean room for assisting the face fitting of respiratory equipment) :

- f) shower equipment including shower head, basin, shampoo & soap, nail brush, etc., and water filtration system capable of filtering particles down to 6µm in suspension. The water supply should also be checked on the sufficiency and cleanliness of water source.
- g) warning signs;

PERSONAL PROTECTIVE ITEMS

12. Personal protective equipment includes :

- a) disposable, impervious coveralls with hood and shoe cover;
- b) approved half mask respirators and/or full-face powered respirators fitted with approved disposable cartridge with HEPA filters.
- c) Generally, all abatement procedures for friable ACMs would require the full-face type respirators. The compliance of these items should be checked against the Factory and Industrial Undertakings (Asbestos) Special Regulation and their related Codes of practice;
- d) eye protector (for sharp/cementitious ACMs only) or where such are needed for safety reasons.

WASTE DISPOSAL ITEMS

13. Asbestos waste, depending on its physical nature, can either be stored in waste bags or steel waste drums. Generally, for asbestos waste that has sharp edges that may cause damage to waste bags and are bulky, or the waste is wet or heavy, they should be stored in waste drums. However, sometimes an additional woven bag as the innermost bag can be used if the sharp items are not large in size.

14. In any case, an appropriate warning sign with "DANGER - ASBESTOS WASTE, DO NOT INHALE DUST" in both Chinese and English printed on them must be put on the waste containing medium. In the case of waste drums, the type of asbestos (chrysotile, amosite, crocidolite etc.) should be specified as part of the label.
15. Asbestos waste bags
 - a) Inner layer waste bags should be made of 0.15mm thick polythene and appropriately colour coded following the guideline below :
 - transparent for bonded ACM excluding blue/brown asbestos.
 - white for chrysotile (white asbestos);
 - orange for any other type of asbestos apart from chrysotile;
 - b) Outer layer waste bags should be made of 0.15mm thick polythene and must be transparent so that the inner layer coloured bag can be seen.
 - c) Each layer of the bagged waste should be vacuum packed and goose-neck sealed with tape. This practice is important to help minimize damage to the plastic layers during temporary storage and handling of the waste. Any damaged plastic bag will be self-revealing in that the bagged waste would become puffy due to loss of the vacuum, meaning that at least an additional layer of plastic is required, i.e. vacuum packed and goose-neck sealed again, to avoid release of asbestos fibres.
16. Asbestos waste drums
 - a) The waste drums should be made of mild steel (light duty with removable heads). These drums are of full aperture type and the lids may be secured with latch, lever, or nut and bolt.

ACM REMOVAL ITEMS

17. Apart from exceptional cases where written approval is granted by the authorities, removal of ACMs should be conducted using hand tools only. These hand tools could be paint scrapers, wire brushes etc.

6.3 Visual Inspection

GENERAL

1. The main purpose of the visual inspection is to check whether the asbestos removal work is complete. Although asbestos fibres, in their most lethal size, are invisible to the human eye, the air samples and the thorough cleaning have helped to ensure the cleanliness of the containment.
2. Because the human eye cannot distinguish asbestos fibres from other fibres, any fibre or dust that is visibly detectable is treated as asbestos fibre.
3. If any fibres or dust are visible it is clear indication that the cleaning has not been thorough enough.
4. The visual inspection involves the following aspects:
 - a) personal protection
 - b) visual inspection
 - c) decontamination

PERSONAL PROTECTION

5. To ensure personal safety, the visual inspections should only be conducted after satisfactory penultimate air test results have been received from the laboratory.
6. Although satisfactory penultimate air test results are normally a good indication of cleanliness, the site staff should still take care in putting on the protective equipment such as coveralls and a half mask respirator. **Paper masks are not to be used.**

VISUAL INSPECTION

7. In conducting the visual inspection, the site staff should check every corner of the containment, not only the surfaces previously covered with ACM. A good method is to wipe a finger across the plastic sheet to check the dustiness.
8. Take care to look at the duct tapes where peeling could have occurred. As the duct tapes have very strong adhesives, fibres or debris can easily get stuck where there is not a perfect seal. The use of a torch will assist in the inspection.

DECONTAMINATION

9. If the site staff are satisfied that the work area is cleaned, they will not be expected to carry out extensive decontamination when leaving from the decontamination unit.
10. As a minimum however, wet-wiping with a clean towel and washing the hands and face should be carried out. Any tools brought into the containment such as torches shall be cleaned by wet-wiping before taking them out of the containment.

6.4 Smoke Test

GENERAL

1. The smoke test is used in the following activities :
 - a) containment integrity check
 - b) air mover efficiency check

CONTAINMENT INTEGRITY CHECK

2. After the site staff are fully satisfied with the integrity of the containment, a smoke test is carried out. The purpose of the smoke test is to ensure the air-tightness of the Containment.
3. When the site staff are ready for the smoke test, the contractor is instructed to prepare the containment by filling it with non-toxic smoke, usually by means of a smoke generator. As the test is to ensure that the containment is air-tight, any trace of smoke leakage from the containment is not acceptable and rectification should be carried out immediately (usually by applying duct tape or foam).
4. External lighting should be switched off as this would affect the ease of visually detecting the smoke. Site staff should inspect the containment by shining a torch along the sides of the containment, concentrating on the joints, where leakage is most likely.

AIR MOVER EFFICIENCY CHECK

5. The purpose of the test is to check the efficiency of the air mover and to ensure that the negative pressure required is attained. When there is no visual leakage of smoke from the containment, the air mover and the negative pressure monitor should both be switched on.
6. The site officer should then check visually to see if all smoke inside the containment is extracted, that the absolute filters screen out the smoke effectively and that the pressure gauges read normal.
7. The test is important because the path of smoke extraction can indicate whether all area of the containment fall within the extractable zone. Should there be any short-circuiting of the extraction path, there will be areas of the containment where smoke will congregate and stay.
8. In order for this visual assessment to be accurate, the site staff may be required to enter the containment in order to obtain a complete picture of the extraction profile of the smoke.

9. The short-circuiting of the extraction path might be due to the location of the decontamination unit (the entry/exit points) and the air mover. In theory they should be located in diagonally opposite corners of the containment. For a very large containment, 2 air movers placed at 2 strategically chosen locations may be required.
10. If the particular site conditions make it difficult to satisfy the above requirements, the smoke test will be especially useful in determining the integrity of the containment in terms of the air change effectiveness and the negative pressure.

6.5 Air Monitoring

GENERAL

1. Air monitoring tests are conducted at various stages of the asbestos abatement work. Asbestos abatement works are normally done under full/mini containment, or segregation.
2. Air monitoring tests required for asbestos abatement work performed under full/mini containment are :
 - a) Background
 - b) Leakage
 - c) Penultimate
 - d) Final Clearance, and
 - e) Personal.
3. Air monitoring tests required for asbestos abatement work performed under segregation are :
 - a) Background
 - b) Environmental
 - c) Reassurance
 - d) Personal.

BACKGROUND TEST

4. Background samples are collected after the pre-cleaning of the work site but before building of the containment or segregation commences. Background air tests should generally be collected one day before the commencement of building the containment or segregation. The building of the containment or segregation is not to commence until the background samples have been received and interpreted to be acceptable.
5. The background sample will not necessarily be under 0.01 fibres/mL because there may be other sources of fibre generation that cannot be isolated or removed. If the site officer is not convinced that there are other sources of fibre generation contributing to the excessive fibre level, the 0.01 fibres/mL criteria should be imposed.
6. Another common problem that may occur with background sampling is dust overloading of the filter. This may occur in cases such as where the work site is open and in close proximity to heavy traffic, or there is dusty construction work nearby.
7. Where there is a problem with dust overloading of the filter, the contractor should be instructed to clean the site as thoroughly as possible, then :
 - a) For works under containment, have the containment built. The inside of the containment should then be cleaned after it is completed. Background re-sampling are then carried out inside the containment. In this case, background sample results of 0.01 fibres/mL are required.

- b) For works under segregation, take multiple samples of shorter duration and pool the results. This method is used as a last resort.

LEAKAGE TEST

- 8. Leakage samples are taken to continuously monitor the integrity of the containment. Four leakage samples are required as a minimum. The suggested locations for these four samples are as follows :-
 - a) one inside the clean room of the decontamination unit or debris port;
 - b) one at 1.5m away from the unobstructed exhaust of an air mover;
 - c) two area samples outside the containment remote from the decontamination unit;
- 9. If the containment is large, the site officer may, at their own discretion, request for further leakage sampling be carried out.
- 10. Leakage samples are acceptable if they are below 0.01 fibres/mL, or are not greater than the original background sampling results. If leakage sample results are considered unacceptable, all asbestos abatement work should be stopped and remedial action(s) taken. This may involve one or more of the following :
 - a) a thorough checking of the containment for leaks, especially when the area samples are exceeding the required level, and/or
 - b) checking the effectiveness of the air mover, hence the negative pressure if the clean room sample exceeds the requirements, and/or
 - c) checking the integrity of the air mover, such as the maintenance record of the HEPA filter. If in doubt, site officer should request the changing of the air mover.

ENVIRONMENTAL TEST

- 11. Environmental samples are taken in the vicinity of an asbestos abatement work area to check the ambient fibre level. Any sudden rise in the ambient level is investigated to determine if it is due to a failure of the precautionary measures taken in the asbestos works.

PENULTIMATE TEST

- 12. Penultimate samples are taken after the innermost plastic layer of the containment has been HEPA vacuumed and wet-wiped, PVA sprayed and removed, and the 2nd innermost plastic layer HEPA vacuumed and wet-wiped.
- 13. Penultimate test samples are acceptable if under 0.01 fibre/mL. If the Penultimate sample exceeds the requirement, the containment should be re-cleaned by HEPA vacuuming and wet-wiping and further Penultimate tests carried out.

14. The Laboratory is responsible for carrying out a visual inspection and ensuring that there is no fibre/debris visually detectable before the Penultimate samples are carried out. If the Contractor fails the visual inspection carried out by the Consultant (after Penultimate tests), the site would be required to be re-cleaned and Penultimate tests re-carried out. The fees so incurred will be borne by the Specialist Testing Contractor, not the Contractor.

FINAL CLEARANCE TEST

15. Final Clearance tests are carried out after the visual inspection finds the area clean and free of fibres/dust, the surfaces previously covered with ACM sealed and PVA sprayed, the 2nd innermost layer of plastic sheet PVA sprayed and removed, and the work area HEPA vacuumed and wet-wiped once more.
16. Final Clearance test samples are acceptable if under 0.01 fibre/mL. If the Final Clearance samples exceed the standards, the containment should be re-cleaned by HEPA vacuuming and wet-wiping and further Final Clearance tests carried out.

PERSONAL TEST

17. Personal samples are requirements by the labour Department and are taken to monitor the fibre level asbestos workers are subjected to during asbestos abatement work. The sampler should be fixed to the worker's coverall and within his breathing zone.
18. Personal samples must comply to the following standards :-
 - 0.5 fibres/mL for Chrysotile;
 - 0.2 fibres/mL for asbestos fibre other than Chrysotile.

REASSURANCE TEST

19. As asbestos abatement work performed under segregation is done under open air conditions, only one set of clearance indicators is required and these samples are termed Reassurance.
20. Reassurance samples are taken after completion of asbestos removal, thorough cleaning of the site, and surfaces previously covered by ACM sprayed with PVA. Locations of the samples are at where the asbestos abatement took place and at the periphery of the segregation.
21. The fibre level indicated by the reassurance test should not exceed 0.01 fibre/mL or that of the background test, whichever is the higher.

6.6 Lump sum contracts

GENERAL

1. The MS/BSE/PSA prepares the tender documents for a lump sum contract for asbestos abatement works in accordance with the HD's Contract Procedures manuals, as appropriate. The documents generally consist of the following :
 - a) Conditions of Tender
 - General Conditions
 - Special Conditions
 - b) Form of Tender
 - c) Articles of Agreement
 - d) Conditions of Contract
 - General Conditions
 - Special Conditions
 - e) General Specification
 - f) Particular Specification
 - Part A, The Works
 - Part B, Amendments to the GS
 - Appendices
 - g) Schedule of Quantities (& Rates)
 - h) Summary of Tender
2. The MS/BSE/PSA seeks advice from SMS/R&D or CTO(BS)/TD as appropriate, for the detail preparation of the documentation.

FORM OF TENDER

3. The Form of Tender should include details of the :
 - a) Description of the Works;
 - b) Site of the Works; and
 - c) Working Period.

SPECIAL CONDITIONS OF TENDER

4. In addition to listing the documents issued and the documents available to the tenderers the Special Conditions of Tender should include the following paragraph:

Other submissions required with tender

In accordance with condition GCT 3(c), any further information described in Appendix B of the Particular Specification is required to be submitted with the tender.

PARTICULAR SPECIFICATION, PART A - THE WORKS

5. Part A, The Works, defines the Project, identifies the Contract Manager and gives a general description of the works.

6. Paragraphs are added to Part A concerning the asbestos abatement work to be carried out by registered asbestos contractor employed direct by the Authority/PSA (if appropriate). Air monitoring and testing for asbestos removal shall normally be carried out by HD's term testing services contractor (request to be made through SCE/MTM).

PARTICULAR SPECIFICATION, PART B - AMENDMENTS AND ADDITIONS TO THE GS

7. [Appropriate](#) Appendices A to F should be inserted in the Particular Specification.

PARTICULAR SPECIFICATION - APPENDICES

8. The detail requirements for asbestos abatement works are described in the appendices to the Particular Specification. The following appendices are added to the Particular Specification for Lump Sum contracts:

Appendix A	-	Definitions
Appendix B	-	Asbestos Works
Appendix C	-	Emergency Measures
Appendix D	-	Equipment Standards
Appendix E	-	Standard Forms
Appendix F	-	Asbestos Work Methods (see below)

9. Appendix A, Definitions, defines the terms associated with asbestos works as used in the contract. Refer EMDTG08-2.1.
10. Appendix B, Asbestos Works, is the general specification for asbestos works. Refer EMDTG08-2.2.
11. Appendix C, Emergency Measures, sets out the measures the contractor is required to take in the case of an emergency during the course of asbestos removal works. Refer EMDTG08-2.3.
12. Appendix D, Equipment Standards, sets out the standards for the specific equipment and materials used in asbestos removal works. Refer EMDTG08-2.4.
13. Appendix E, Standard Forms, includes the standard forms that the contractor is required to use for requesting approvals and inspections. Refer EMDTG08-2.5.
14. Appendix F, Asbestos Work Methods, sets out the work method guideline for the specific type of asbestos removal works. Only the work method relevant to the works is included as Appendix F. Refer to EMDTG08 section 3 and section 4 for Building Works and Building Services asbestos work methods respectively.

15. Where guidance on the preparation of the particular specification is included in a sample document it is enclosed in brackets and identified. All guidance notes must be deleted from the final printout of the particular specification.
16. Copies of the sample documents and specifications contained in EMDTG08 may be obtained in electronic and hardcopy form from QMU/M.
17. Refer to EMDTG08, Section 1.2, for a sample particular specification for contracts covering specialist asbestos abatement works.

6.7 Quotations

GENERAL

1. The MS/BSE/PSA prepares the quotation documents for a quotation for asbestos abatement works in accordance with the Maintenance Works Process Manual as appropriate. The documents generally consist of the following :
 - a) Conditions of Quotation
 - b) Form of Quotation
 - c) Conditions of Contract
 - d) General Specification
 - e) Particular Specification - Appendices
 - f) Schedule of Quantities (& Rates)
 - g) Summary of Quotation
2. The MS/BSE/PSA seeks advice from SMS/R&D or CTO(BS)/TD as appropriate, for the detail preparation of the documentation.
3. The specific requirements for the asbestos abatement works are included in the Quotation Terms and the Particular Specification as described below.

FORM OF QUOTATION

4. HD's Maintenance Works Process Manual contains standard Form of Quotation.

QUOTATION TERMS

5. The quotation terms generally consist of the following :
 - a) List of the documents making up the quotation documents.
 - b) Conditions of Quotation

CONDITIONS OF QUOTATION

6. The conditions of quotation includes the following :
 - a) List of the documents issued to tenderers.
 - b) Conditions of Contract
 - c) Inspection of other documents
 - d) Definitions
 - e) Description of the Works;
 - f) Site of the Works;
 - g) Working Period; and
 - h) Other submissions required with quotation.
7. Refer to the sample Quotation Terms at EMDTG08-1.1.

PARTICULAR SPECIFICATION

8. The particular specification consists of amendments to the general specification and appendices setting out the detail specification for asbestos works.

9. [Appropriate](#) Appendices A to F [should be inserted into the Particular Specification](#).
10. Refer to the sample particular specification at EMDTG08, Section 2.
11. The detail requirements for asbestos abatement works are described in the appendices to the Particular Specification. The following appendices are added to the Particular Specification:

Appendix A	-	Definitions
Appendix B	-	Asbestos Works
Appendix C	-	Emergency Measures
Appendix D	-	Equipment Standards
Appendix E	-	Standard Forms
Appendix F	-	Asbestos Work Methods (see below)
12. Appendix A, Definitions, defines the terms associated with asbestos works as used in the contract. Refer EMDTG08-2.1.
13. Appendix B, Asbestos Works, is the general specification for asbestos works. Refer EMDTG08-2.2.
14. Appendix C, Emergency Measures, sets out the measures the contractor is required to take in the case of an emergency during the course of asbestos removal works. Refer EMDTG08-2.3.
15. Appendix D, Equipment Standards, sets out the standards for the specific equipment and materials used in asbestos removal works. Refer EMDTG08-2.4.
16. Appendix E, Standard Forms, includes the standard forms that the contractor is required to use for requesting approvals and inspections. Refer EMDTG08-2.5.
17. Appendix F, Asbestos Work Methods, sets out the work method guideline for the specific type of asbestos removal works. Only the work method relevant to the works is included as Appendix F. Refer to EMDTG08 section 3 and section 4 for Building Works and Building Services asbestos work methods respectively.
18. Where guidance on the preparation of the particular specification is included in a sample document it is enclosed in brackets and identified. All guidance notes must be deleted from the final printout of the particular specification.
19. Copies of the sample documents and specifications contained in EMDTG08 may be obtained in electronic and hardcopy form from QMU/M.

LIST OF DOCUMENTS ISSUED TO TENDERERS

20. The following documents are issued to the tenderers :
 - a) Conditions of Quotation
 - b) Form of Quotation [and one additional form of quotation](#)
 - c) [Special](#) Conditions of Contract
 - d) Particular Specification
 - e) Schedule of Quantities
 - f) Summary of Quotation

INSPECTION OF OTHER DOCUMENTS

21. Where the General Specification and other additional documents are provided for inspection only, the following paragraph is included together with the appropriate list of documents :

The following additional document(s) may be inspected at the office of the Contract Manager's Representative :-

a) The General Specification for Building Works 2013 Edition, issued by the Estate Management Division of the Housing Department.

For the purpose of this clause the appropriate officer is :
Mr. at telephone No.

DEFINITIONS

22. Refer to the sample Quotation Terms at EMDTG08-1.1.

6.8 List of Exempted Classes of Works

List of exempted classes of works to be specified under s.69(2) of the Air Pollution Control Ordinance

An owner of premises is not required to submit an asbestos investigation report or an asbestos abatement plan for the following works :

Class 1

Maintenance, repair, use, handling or abatement of :-

- (1) non-woven non-friable asbestos gasket.
- (2) asbestos gland packing material in pump, valve, engine and other mechanical plant items.
- (3) non-friable asbestos friction products.
- (4) corrugated asbestos cement sheet not within a fire site.
- (5) asbestos cement watermains maintained by Water Supplies Department.
- (6) asbestos blackboard
- (7) fuse box/switch box containing asbestos materials
- (8) resilient floor covering not within a fire site, such as : -
 - (a) vinyl asbestos floor covering; and
 - (b) sheet vinyl asbestos floor covering; and
 - (c) bitumen asbestos roofing felt.

Class 2

Maintenance, repair, handling or abatement of the following materials installed in properties managed by the Hong Kong Housing Authority : -

- (1) balcony asbestos cement grille panel.
- (2) staircase asbestos cement grille panel.
- (3) roof asbestos cement insulation tile.
- (4) asbestos cement soil stack.
- (5) asbestos cement refuse chute.
- (6) laboratory asbestos bench-top.

Class 3

Storage or sale of asbestos containing material.

Class 4

Manufacturing process involving asbestos.

Class 5

Transport of asbestos containing material.

List of exempted classes of works to be specified under s.75(4) of the Air Pollution Control Ordinance

An owner of premises is not required to engage a registered asbestos contractor to carry out the following works :

Class 1

Maintenance, repair, use, handling or abatement of : -

- (1) non-woven non-friable asbestos gasket.
- (2) asbestos gland packing material in pump, valve, engine and other mechanical plant items.
- (3) non-friable asbestos friction products.

Class 2

Demolition work involving only resilient floor covering in a vacant building not within a fire site, such as : -

- (1) vinyl asbestos floor tile;
- (2) sheet vinyl asbestos floor covering; and
- (3) bitumen asbestos roofing felt.

Class 3

Storage or sale of asbestos containing material.

Class 4

Manufacturing process involving asbestos.

Class 5

Transport of asbestos containing material.

ASBESTOS MANAGEMENT

2.3 Management Strategy**GENERAL**

1. The Asbestos Management Programme provides a comprehensive plan for the implementation of the Housing Department's asbestos management strategy. The programme includes the following asbestos management activities :

- Identification of ACM
- Training
- Personnel Protection
- Periodic ACM Surveillance
- Central Records
- Abatement
- Emergency Procedures
- Special Procedures

IDENTIFICATION OF ACM

2. Most of the existing Asbestos Containing Materials within property managed by the Housing Department & HKHA's management agents have been identified and the type of asbestos, location and condition recorded.

3. Where records do not exist of a material suspected of containing asbestos, staff arrange for the material to be sampled in accordance with Section 5.6, BULK SAMPLING, and report the results on Form EMDTG07-F02 to SMS/R&D or CTO(BS)/TD as appropriate. The results of any bulk sampling arranged during the course of demolition works are copied to SMS/R&D.

4. The majority of ACM materials accessible to the tenants, public or HD staff are of the cement bonded type, and due to the quantities involved these have not been individually labelled. Where balcony grill panels containing asbestos have been encapsulated since 1989, these have been marked to aid later identification. Refer to Section 3.3, ASBESTOS ABATEMENT.

5. Staff are notified of the location and condition of ACM through regular reports based on the central records of ACM. Tenants and the public can view these reports at the relevant Estate Office.

6. New materials used in the construction and maintenance of property are screened for free of asbestos before being approved for use.

TRAINING

7. HD staff are provided with training on a need basis to ensure that they are aware of the possible occurrence of ACM in buildings and in materials, and to ensure that they are familiar with the policy, responsibilities and procedures for the management and abatement of asbestos.

8. Staff required to use personal protective equipment in the inspection and monitoring of asbestos abatement activities are provided with training in its care and use.

GENERAL

1. This particular specification covers the encapsulation of asbestos cement staircase and balcony grille panels, where the panels are in good condition and the works are handled as normal building maintenance work.
2. The Contractor shall execute the asbestos encapsulation works in accordance with the following procedures :-

2.1 Equipment

For this operation, the following equipment is required as a minimum, and to the standard specified in appendix D;

- (a) Paper Mask
- (b) Vacuum Cleaner
- (c) Rust Inhibitor of an approved chemical type of neutralisation of existing rust.

2.2 Cleaning

Clean the grille panel with vacuum cleaner to remove all debris and dust particles. Cover balcony floor with plywood sheets to catch debris.

ENCAPSULATION WORKS3. Encapsulation of the panel

- (a) Apply rust inhibitor to exposed reinforcing steel. Also apply bond coat of cement slurry, 1:2 mix, to surfaces of grille panel.
- (b) Fix galvanised steel expanded metal lathing to each face of the panel using stainless steel wire tiles.
- (c) Apply 20mm thick external rendering consisting of cement, lime, and sand, to both faces of the grille panel as follows :-
 - First coat, 10mm thick - mix 1:3 (cement, sand)
 - Finishing coat, 10mm thick - mix 1:3:6 (cement, lime, sand)

4. Marking

Press the standard mark into both faces of the panel before the mortar sets. The mark should be approximately 3mm to 5mm deep, and positioned in the top right hand corner of the panel, as shown in Fig. 5-1.

5. Clearing Site

Vacuum clean the balcony floor, clean up and wipe off all surfaces, leave site clean and tidy on completion.

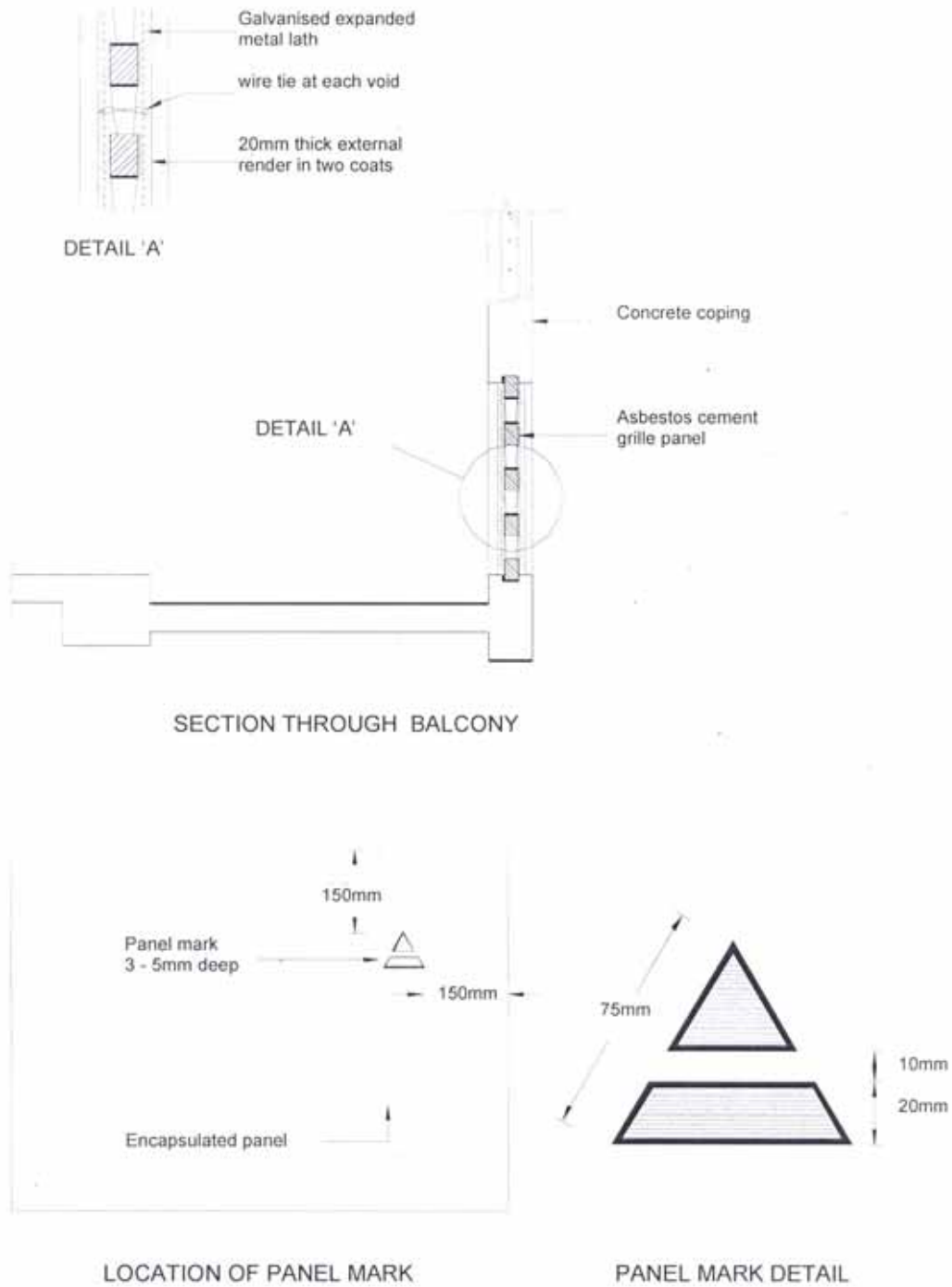


Figure 5-1 : Encapsulation of Balcony Grille

Meeting Dates of Asbestos Working Group

7/9/1988	1 st meeting	EPD, LD, HD
7/10/1988	2 nd meeting	EPD, LD, HD and EHS Consultants
4/11/1988	3 rd meeting	EPD, LD, HD and EHS Consultants
9/12/1988	4 th meeting	EPD, LD, HD and EHS Consultants
17/2/1989	5 th A meeting	EPD, LD, HD and EHS Consultants
7/3/1989	Special meeting	EPD, LD, HD and EHS Consultants
14/4/1989	6 th meeting	EPD, LD, HD and EHS Consultants
31/5/1989	7 th special meeting	EPD, LD, HD and EHS Consultants
21/8/1989	8 th meeting	EPD, LD, HD and EHS Consultants
29/11/1989	9 th meeting	EPD, LD, HD and EHS Consultants
10/1/1990	10 th meeting	EPD, LD, HD and EHS Consultants
11/4/1990	11 th meeting	EPD, LD, HD and EHS Consultants
8/3/1991	12 th meeting	EPD, LD, HD and EHS Consultants
7/6/1991	13 th meeting	EPD, LD, HD and EHS Consultants
6/9/1991	14 th meeting	EPD, LD, HD and EHS Consultants
6/12/1991	15 th meeting	EPD, LD, HD and EHS Consultants
3/3/1992	16 th meeting	EPD, LD, HD and EHS Consultants
12/6/1992	17 th meeting	EPD, LD, HD and EHS Consultants
4/9/1992	18 th meeting	EPD, LD, HD and EHS Consultants
4/12/1992	19 th meeting	EPD, LD, HD and EHS Consultants
5/3/1993	20 th meeting	EPD, LD, HD and EHS Consultants
4/6/1993	21 st meeting	EPD, LD, HD and EHS Consultants
7/9/1993	22 nd meeting	EPD, LD, HD and EHS Consultants
3/12/1993	23 rd meeting	EPD, LD, HD and EHS Consultants
8/3/1994	24 th meeting	EPD, LD, HD and EHS Consultants
27/5/1994	25 th meeting	EPD, LD, HD and EHS Consultants
25/8/1994	26 th meeting	EPD, LD, HD and EHS Consultants
28/11/1994	27 th meeting	EPD, LD, HD and EHS Consultants
24/2/1995	28 th meeting	EPD, LD, HD and EHS Consultants
29/5/1995	29 th meeting	EPD, HD and EHS Consultants
25/8/1995	30 th meeting	EPD, HD and EHS Consultants
24/11/1995	31 st meeting	EPD, LD, HD and EHS Consultants
28/2/1996	32 nd meeting	EPD, HD and EHS Consultants
29/5/1996	33 rd meeting	EPD, LD and HD
5/9/1996	34 th meeting	EPD, LD and HD
23/1/1997	35 th meeting	EPD, LD and HD

22/5/1997	36 th meeting	EPD and HD
28/8/1997	37 th meeting	EPD, LD and HD
5/12/1997	38 th meeting	EPD, LD and HD
6/3/1998	39 th meeting	HD
19/6/1998	40 th meeting	LD and HD
18/9/1998	41 st meeting	EPD, LD and HD
11/12/1998	42 nd meeting	EPD, LD and HD
12/3/1999	43 rd meeting	LD and HD
4/6/1999	44 th meeting	EPD, LD and HD
3/9/1999	45 th meeting	EPD, LD and HD
3/12/1999	46 th meeting	LD and HD
22/3/2000	47 th meeting	EPD, LD and HD
9/6/2000	48 th meeting	EPD and HD
8/9/2000	49 th meeting	EPD, LD and HD
1/12/2000	50 th meeting	EPD, LD and HD
2/3/2001	51 st meeting	EPD, LD and HD
1/6/2001	52 nd meeting	EPD and HD
3/9/2001	53 rd meeting	LD and HD
3/12/2001	54 th meeting	LD and HD
1/3/2002	55 th meeting	LD and HD
3/6/2002	56 th meeting	EPD, LD and HD
2/9/2002	57 th meeting	EPD, LD and HD
2/12/2002	58 th meeting	LD and HD
3/3/2003	59 th meeting	LD and HD
10/9/2003	60 th meeting	LD and HD
28/9/2010	1 st Inter-departmental liaison meeting	EPD, LD and HD
19/7/2011	2 nd Inter-departmental liaison meeting	EPD, LD and HD
29/4/2014	3 rd Inter-departmental liaison meeting	EPD, LD and HD
13/9/2016	4 th Inter-departmental liaison meeting	EPD, LD and HD
30/9/2016	5 th Inter-departmental liaison meeting	EPD, LD DoH and HD

EPD – Environmental Protection Department

LD – Labour Department

HD – Housing Department

DoH – Department of Health

5.5

ASBESTOS MANAGEMENT

5.5 Asbestos Working Group Terms of Reference**MEMBERSHIP**

1. The membership of the Asbestos Working Group (AWG) is as follows :-

Chairman	CM/M(PM)
Members	SMS/R&D
	SSE/15
	SE/122
	SE/SIS3
	CTO(BS)/TD
	HM/BPS2
Secretary	MS/ENV

Representative from :

Environmental Protection Department.
Labour Department

TERMS OF REFERENCE

2. - to advise the Permanent Secretary of Housing on the continued development of an asbestos abatement strategy;
- to receive and consider information on materials containing asbestos in Housing Authority managed property;
- to receive and consider information on the Housing Department's asbestos abatement programmes;
- to keep under review the Housing Department procedures for removal or encapsulation of materials containing asbestos, and to provide advice to the Housing Department on these procedures to ensure standards of asbestos abatement are appropriate for the level of risk;
- to receive and consider information of the performance of asbestos abatement contractors and consultants undertaking work for the Housing Department, and the results of associated routine air monitoring.

FREQUENCY OF MEETINGS

3. Meetings are held annually.

FILE REFERENCE

4. HD3-4/RD/-9/3

- 所在位置與天然及人工通風途徑的相對關係；及

- 緊接範圍的人口及活動。

因首次暴露於石棉至有疾病徵狀出現，中間潛伏期會長約十至四十年不等。既然有此情況，應特別注意較易因石棉而引致疾病的嬰兒及學童。

八·三 註冊石棉顧問宜盡可能將任何其他認為有用及相關的資料列入調查報告內。

九 石棉管理計劃

九·一 石棉管理計劃應可獨立成文，由註冊石棉顧問簽署，以確認計劃內載資料均屬真確。

九·二 含石棉物料即使存在，也不一定意味處所或船舶使用人的健康正受到危害。註冊石棉顧問應充分考慮石棉調查結果，然後決定是否需要進行石棉消滅工程。假如無需進行石棉消滅工程，則應該提供操作及保養計劃。假如必需進行石棉消滅工程，則應擬備石棉消滅計劃。因此，對於無需進行消滅工程的含石棉物料及其他懷疑含石棉物料，石棉管理計劃應提供操作及保養計劃；若要進行石棉消滅工程或涉及使用或處理含石棉物料的工程，則另外提供石棉消滅計劃。

十 操作及保養計劃

十·一 操作及保養計劃旨在訂定作業方法，以便：

- 使含石棉物料及懷疑含石棉物料維持在良好狀態；

- 確保妥善清除先前釋出的石棉纖維；
 - 防止進一步釋出石棉纖維；
 - 監察含石棉物料及懷疑含石棉物料的狀況；及
 - 安全處理意外釋出的石棉纖維。
- 十·二 操作及保養計劃應述明針對有關處所或船舶而制訂的操作及保養方針和程序，如有需要，要定期修訂更新，並使各有關人員可以取得及知悉這些資料。計劃內至少應包括下列資料：
- 處所或船舶的詳細描述：
 - 詳細描述有關處所或船舶的位置、樓齡或船齡、結構、用途、使用模式及主要活動及概述毗鄰處所或船舶的用途及活動。
 - 實施操作及保養計劃的人事組織：
 - 這包括一組織圖表，當中要列明行政及權力架構（附姓名或名稱及職位）及界定主要參與者（如處所或船舶的擁有人、註冊石棉顧問、負責監管及保養的監管人及員工、註冊石棉承辦商等）的職責。
 - 已辨別出的含石棉物料及懷疑含石棉物料的詳情：
 - 應表列所有已辨別出的含石棉物料及懷疑含石棉物料的特性、種類、數量及物理狀況，並應在樓宇圖則或草圖上標示所有已辨別出的含石棉物料及懷疑含石棉物料的確實位置。

■ 已辨別出的含石棉物料及懷疑含石棉物料的狀況：

描述所有已辨別出的含石棉物料及懷疑含石棉物料的狀況，及詳細描述任何受損毀物料的尺寸、再受損毀的可能性及空氣質素的量度（如適用）。若先前釋出的石棉污染物經予清除，則應詳加述明清除工作。如受損毀的含石棉物料位於天然或人工通風系統吹風經過處，以致纖維可被吹送，則清理工作可能要廣及整個處所，甚至通風系統。

■ 含石棉物料或懷疑含石棉物料不應拆除的理由：

原處含石棉物料或懷疑含石棉物料通常可留於原處並予以有效管理，但若選用其他石棉消滅方法，如延遲行動、漿封或圍封，則應說明理由。所提出的理由應以調查結果為依據。

■ 標識含石棉物料的方法：

所有已辨別出的含石棉物料若無需拆除，便應按照附錄 3 內載規定，加以標識。至於標識方法及標籤保養的詳情，亦應說明。

■ 告知所有可能受影響人士的方法：

對於工人、住戶及處所或船舶的其他使用人，適宜將可能受到他們干擾的含石棉物料的位置和物理狀況坦誠公開，並鼓勵他們向處所或船舶的擁有人報告任何含石棉物料受干擾的跡象或受損情況，以便採取矯正措施。應詳加說明能達至上述效果的溝通渠道及方法。

■ 監察方案：

應至少每兩年一次委任一註冊石棉顧問全面覆查所有含石棉物料及懷疑含石棉物料。期間可利用一項經小心設計的計劃，以監察懸浮於空氣中的石棉纖維，使能及早察覺含石棉物料是否狀況惡化或已受到干擾。對於物料在不同時日的狀況，若能拍攝彩照以供比較，則甚為有用。應提供達至上述效果的監察方案的詳情。

■ 避免擾動含石棉物料的方法：

應鼓勵工人、住戶及處所或船舶的其他使用人，在展開任何工程前（即使是預定的小型保養及翻新工程），知會處所或船舶的擁有人。除此，亦應建立核准制度，用以：

- 監察任何操作及保養工程的活動；
- 防止含石棉物料或懷疑含石棉物料受到意外擾動；及
- 阻止使用新的含石棉物料。

上述保養或翻新工程申請表及核准書樣本見附錄 4 及 5。至於該知會及核准制度的行政細節，亦應說明。

■ 備存紀錄方案：

應提供為所有石棉管理文件而制訂的備存紀錄方案的詳情。這些石棉管理文件，包括調查及評估報告、操作及保養計劃、方針及工程程序、員工培訓及醫療紀錄、纖維釋出報告、飄散於空氣中的纖維監察報告、保養及翻新的知會、簽發的核准書、評估影響含石棉物料的工程及覆驗及監察含石棉物料等。

- 對狀況逐漸惡化的含石棉物料所採取的行動：

應充分解釋處理逐漸惡化的含石棉物料的特別操作及保養方法，以及在何種情況下才需展開徹底的清理工序。

十一 石棉消滅計劃

十一.一 石棉消滅計劃的目的在於定出：

- 消滅含石棉物料的方法；
- 保障工人與環境的工作的成效及準則；及
- 所需要的緊急程序及應變措施。

十一.二 石棉消滅計劃應至少包括下列資料：

- 處所或船舶的詳細描述：
 - 詳細描述有關處所或船舶的位置、樓齡或船齡、結構、用途、使用模式及主要活動，及概述毗鄰石棉消滅工程場地及處所或船舶的用途及活動。至於石棉消滅工程場地的確實位置和界限，應予說明及清楚展示在樓宇圖則或草圖上。
- 註冊石棉顧問、承辦商及化驗所的詳情：
 - 提供受委任進行石棉消滅工程的註冊石棉顧問、註冊石棉承辦商及註冊石棉化驗所的姓名或名稱、註冊編號

Current Condition of Asbestos Containing Material (ACM) at Tai Yuen Estate

Date : 07.01.2009

Location A : R/F at Block A Tai Yan House



The current condition of asbestos corrugated cement sheet is fair.

Photos for current conditions of Asbesto Cement Vent Pipes in Choi Hung Estate



Pak Suet House



Luk Ching House



Chi Mei House



Hung Ngok House



Kam Wan House



Chui King House

Inspection Record



Prepared by : K.C. CHEUNG ACW/R&D3
Project Refuse Chute at Wing Tai House, Fuk Loi Estate
Date : 23-11-2009



1. DESCRIPTION : Encapsulated ACM refuse chute at roof floor

2. DESCRIPTION : Encapsulated ACM refuse chute at roof floor



3. DESCRIPTION : ACM refuse chute at roof floor

4. DESCRIPTION : ACM refuse chute at roof floor



5. DESCRIPTION : ACM refuse chute at roof floor

6. DESCRIPTION : ACM refuse chute at roof floor



Inspection Record

Prepared by : Y.M. TSANG WSI/R&D21
Project Long Bin Interim Housing
Date : 11-1-2010



1. DESCRIPTION : Asbestos corrugated sheet at roof of blk. 9



2. DESCRIPTION : Asbestos corrugated sheet at roof of blk. 9



3. DESCRIPTION : Asbestos corrugated sheet at roof of blk. 9



4. DESCRIPTION : Asbestos corrugated sheet at roof of blk. 9



5. DESCRIPTION : Asbestos corrugated sheet at roof of blk. 9



6. DESCRIPTION :

ACM Details – Corrugated cement sheet installed by HD

Long Bin Interim Housing – Management office

Photos taken on 23/12/2015

Inspected by : W.W.CHAN(ACW/R&D1)

Finding : Condition in order



ACM Details – Asbestos cement vent pipe

Suspected to be asbestos containing

Choi Hung Estate – Chi Mei, Chiu King, Hung Ngok, Kam Wan, Luk Ching, Pak Suet House

Photos taken on 24/12/2015

Inspected by : W.W.CHAN(ACW/R&D1)

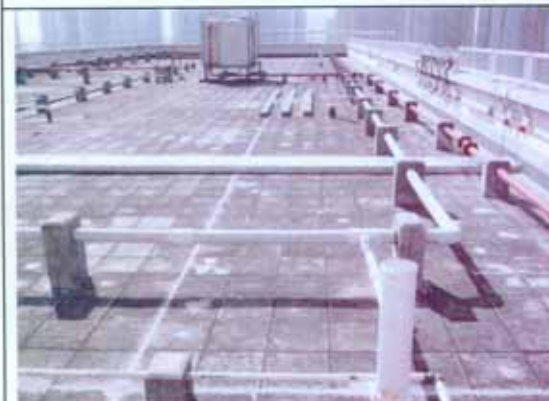
Finding : Condition in order



Chi Mei House(紫薇樓)



Vent pipes at roof



Vent pipes at roof



Condition of vent pipe



Condition of vent pipe



Condition of vent pipe



Kam Wan House (錦雲樓)



Vent pipes At roof



Vent pipes at roof



Condition of vent pipe



Condition of vent pipe



Condition of vent pipe



Hung Ngok House(紅萼樓)



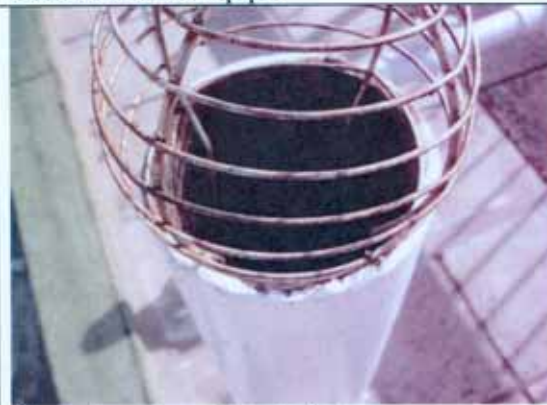
Vent pipes at roof



Condition of vent pipe



Condition of vent pipe



Closed up view of vent pipe



Closed up view of vent pipe



Pak Suet House(白雪樓)



Vent pipes at roof



Vent pipes at roof



Condition of vent pipe



Condition of vent pipe



Condition of vent pipe

ACM Details – Asbestos cement vent pipe

Suspected to be asbestos containing

Choi Hung Estate – Kam Pik, Kam Hon, Kam Wah House

Photos taken on 28/12/2015

Inspected by : W.W.CHAN(ACW/R&D1)

Finding : Condition in order



Vent pipes at roof



Vent pipes at roof



Vent pipes at roof



Vent pipes at roof



Vent pipes at roof



Vent pipes at roof

ACM Details – Corrugated cement sheet installed by tenant

Tai Yuen Estate – Tai Yan House B

Total 2 nos. corrugated sheets at roof

Photos taken on 31/12/2015

Inspected by : W.W.CHAN(ACW/R&D1)

Finding : Condition in order



Tai Yan House(泰欣樓 B)



Corrugated sheet below water tank of roof



Corrugated sheet below water tank at roof



Corrugated sheet below water tank at roof



ACM Details – Vent pipe of refuse chute

Encapsulated/ enclosed

Fok Loi Estate – Wing Lok House

Photo taken : 22/3/2016

Inspected by : C.H.Cheng(WS1/R&D21)

Finding : Condition in order



ACM Details – Roof vent pipe of refuse chute

Encapsulated/ enclosed

Fok Loi Estate – Wing Tai House

Photos taken on 22/3/2016

Inspected by : C.H.CHENG(WS1/R&D21)

Finding : Condition in order



At the public hearing of the Public Accounts Committee (PAC) held on 23 December 2016, we provided members with further information in relation to Part 6 of Chapter 1 of the Director of Audit's Report (the Audit Report) on the "Enhancing fire safety of old public rental housing estates". In response to enquiries raised by the PAC in its letter dated 30 December 2016, we provide our reply as follows:

(II) Enhancing fire safety of old public rental housing estates

- (u) In 2008, the Housing Department (HD), Buildings Department (BD) and Fire Services Department (FSD) started to explore ways for the Hong Kong Housing Authority (HA) to proceed with implementing the Fire Safety (Buildings) Ordinance (FS(B)O). With more than 60 estates of different building design involved and substantial number of buildings for each building design, it took a relatively longer time for the three departments to come to an agreement in adopting a prototype approach to facilitate the implementation of the FS(B)O.

After reaching agreement, the HD proceeded to arrange the fire safety improvement proposals through adopting the prototype approach in implementing the FS(B)O. The reason for longer time involved in processing the prototypes was due to sufficient time was needed by the HD's consultant in preparing the proposals by taking into account the likely effects on tenants and site constraints of existing buildings. At the same time, as each prototype covers a large number of public housing blocks and has a high degree of technical complexity, the enforcement authorities also require adequate time in vetting the proposals. In fact, after the prototypes have been accepted, the HD still needs to submit the fire safety improvement proposals of individual estates to the enforcement authorities for vetting and formal acceptance.

Up to now, three prototypes (Slab, Tower and H) have been accepted by the enforcement authorities, while the remaining four prototypes (Ziggurate/Trident, Linear, Cruciform 1 and Cruciform 2) are being processed. Meanwhile, not all FS(B)O improvement works may be implemented immediately, the HD has been carrying out various kinds of fire safety improvement works over the years under respective maintenance programmes to strengthen the fire safety

measures in public rental housing (PRH) estates. These works include replacement of flat entrance doors, protection to uPVC pipes with fire collars in common areas, installation of fire rated doors at services rooms, installation of battery-type emergency lighting and the automatic sprinkler systems.

Regarding the progress of vetting/formal acceptance, we generally agree with the recommendation as stated in paragraph 6.18 of the Audit Report. Recently, the three departments have reached an agreement on the arrangements for acceptance of fire improvement works. Nevertheless, we would like to stress that HD's works on fire safety have not been delayed.

- (v) The purpose of the FS(B)O is to enhance the fire safety level of some existing old buildings. Although fire safety improvement works could not be immediately implemented at individual PRH estates as per the relevant requirements of the FS(B)O, as stated in paragraph 6.10(a) of the Audit Report, the HD has been carrying out various kinds of fire safety improvement works under respective maintenance programmes to strengthen the fire safety measures in PRH estates aiming at compliance with the FS(B)O voluntarily. These works include replacement of flat entrance doors, protection to uPVC pipes with fire collars in common areas, installation of fire rated doors at services rooms, installation of battery-type emergency lighting and the automatic sprinkler system.

Besides, HA will continue the implementation of a quality fire safety management system, including:

- (i) Standard building layout with spacious common areas

Most of the old PRH blocks adopted standard designs featuring wide corridors for fire escape, spacious common areas and escape staircase to achieve the basic fire safety requirements.

- (ii) Effective estate management practices

Our effective estate management team maintains a quality and safe living environment for tenants. Estate management staff will carry daily patrol to ensure means of escape unobstructed.

We have proper exit and directional signs in place. Besides, a fire safety plan is well established and available in each estate.

(iii) Regular maintenance & improvement of the buildings

Technical staff will regularly inspect the buildings and carry out maintenance works to enhance the living environment of all PRH estates. Besides, the HD also continuous to upgrade the fire safety standard of our PRH estates.

(iv) Regular maintenance of fire services installations

The fire services installations (FSI) of all PRH estates have already been upgraded and are under regular maintenance by registered fire services installation contractors. Instead of having an annual inspection as required under the statutory requirement, the HD conducts half-yearly inspections for the FSI to further enhance the overall fire safety.

(w) When we sought approval from the Building Committee of the HA on implementation of the FS(B)O in PRH estates in March 2014, we proposed to carry out the improvement works in two phases with Phase 1 covering Slab Blocks and Phase 2 covering buildings of the remaining block types.

However, after study, we found that most PRH estates consisted of more than one block type. To achieve better co-operation among tenants and stakeholders and to facilitate smooth implementation of the fire safety improvement works, the proposed improvement works will be carried out on an estate basis instead of in two phases based on block types.

As mentioned in our response in Item (u) above, the HD has been adopting the prototype approach to facilitate the implementation of the FS(B)O. However, we still need to submit the fire safety improvement proposals of individual estates to the enforcement authorities for vetting and formal acceptance after a prototype has been accepted. Since the scope of works could only be ascertained upon the acceptance of the fire safety improvement proposals by the enforcement authorities, the HD will regularly review the budget and programme for the works and seek approval from the Building Committee of the HA in due course.

- (x) As stated in our response in Item (w) above, the proposed improvement works will be carried out on an estate basis instead of in two phases based on block types. The HD has already included the estates with blocks not falling under the seven prototypes into the consultancy studies. After acceptance of the prototypes, fire safety improvement proposals for these estates will be submitted to the enforcement authorities for vetting and formal acceptance.

- (y) The proposal for Wo Che Estate was approved by the BD in August 2016. For Butterfly Estate, our consultant is now revising the proposal according to the comments given by the BD and re-submission for acceptance will be made in early January 2017. For Tai Hing Estate, a revised proposal was submitted for acceptance in December 2016. We understand that the proposal for these prototypes will be accepted by the enforcement authorities in March 2017 provided that Advisory Committee's consideration will not be required.

- (z) Please refer to our reply in Item (u) above.

- (aa) As the fire safety improvement proposals under the pilot scheme for Fuk Loi Estate and Ping Shek Estate have been accepted, the works for these two estates will be commenced and aimed at completion progressively in 2020. For the remaining estates, submission of fire safety improvement proposal to the enforcement authorities for each individual estate will be required after acceptance of prototypes. Adequate consultation will also be necessary before execution of works. Under these circumstances, the HD considered that it is not a suitable time to develop a concrete time table for the execution of works at this moment. However, the HD will continue to review the situation and establish the time table for carrying out the improvement works in due course.

- (bb) Since the HA's building projects of PRH Estates are exempt from the Buildings Ordinance (BO) (Cap. 123), they are not subject to the statutory third party checking by the BD. In order to put these projects under objective scrutiny, the Independent Checking Unit (ICU) under the Director of Housing was established in November 2000 to strengthen the examination of building proposals and the execution of works.

The ICU monitors the statutory compliance of the PRH estates which are not subject to the direct building control under the BO by way of an administrative control system. Under the aforesaid system, all building works carried out in PRH estates which are not subject to the BO still have to comply with the same technical requirements of the BO. The ICU performs regulatory checking according to the BO on building works carried out in PRH estates, while the approval of plans, issue of consent to the commencement of works, site monitoring, final inspections and the issue of an occupation permits for building projects follow those set out under the administrative procedures.