Code of Practice on Asbestos Control

Safe Handling of Low Risk Asbestos Containing Material

Issued under Section 37 of the Air Pollution Control Ordinance (CAP 311)

<PREFACE>

The Code of Practice on Asbestos Control, in four sets, is issued by the Secretary for the Environment, Transport and Works under Section 37 of the Air Pollution Control Ordinance (Chapter 311) after consultation with the Advisory Council on the Environment. It provides advice on matters relating to asbestos control to registered asbestos consultants, registered asbestos contractors, registered asbestos supervisors and registered asbestos laboratories registered in the relevant registers kept and maintained by the Authority under Section 51 of the Ordinance.

The four sets of Codes of Practice provide advice on matters relating to:

1) preparation of asbestos investigation report, asbestos management plan and asbestos abatement plan;
2) asbestos work using full containment or mini containment method;
3) asbestos work using glove bag method; and
4) safe handling of low risk asbestos containing material.

Although these Codes of Practice are not legally binding, compliance with the advice given could be used as evidence of good practice in the course of disciplinary and legal proceedings. It should be noted that the guidance given in these Codes is believed to be the best practice at the time of publication. With advancement in technology and with more experience, it is conceivable that these Codes may require amendment in the future to incorporate new developments. Registered personnel are therefore encouraged to adopt prevailing standards and control measures if such standards are higher than those given in these Codes, and if such control measures are more effective in controlling environmental asbestos.

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1 Introduction

1.1 This Code of Practice provides guidance and advice to registered asbestos consultants, contractors, supervisors and laboratories on safe handling of low risk asbestos containing material.

1.2 Low risk asbestos containing materials means cementitious, resinated, plastic and bituminous asbestos containing materials which are non-friable in nature, that is, when dry, the material cannot be crumbled, pulverized or reduced to powder by hand pressure. Asbestos fibres in these materials are generally locked into the base material matrix, therefore, under normal usage or handling, the quantity of asbestos fibres that can be released, if any, should be insignificant to present a health risk. Examples of low risk asbestos containing materials are: corrugated asbestos cement sheet, cement piping, cement building fabrics, resinated gasket, pump and valve gland packings, friction product, resilient floor covering, and asphalt roofing felt.

1.3 Because of the relatively low risk involved, containment method is normally not necessary for removal of low risk asbestos containing materials if adequate precautionary measures as described below are taken to suppress dust release. However, if the low risk asbestos containing material is in poor condition, or has a high probability of becoming crumbled, pulverized, or reduced to powder by forces expected to act on the material in the course of removal operation, more stringent precautionary measures should be adopted.

1.4 The measures and procedures described in this Code are the minimum requirements necessary for safeguarding the environment and the health of occupants of areas where asbestos abatement work has been carried out. Additional precautionary measures may be necessary for certain operations and this Code should not be interpreted as precluding the adoption of such measures. The requirements of the Factories and Industrial Undertakings Ordinance for worker safety are particularly relevant in this regard.

2 Materials and Equipment

2.1 The materials and equipment used should conform to the following:

- For preparation of work area, transparent plastic sheets of 0.15mm thickness manufactured from extruded low-density polythene to B.S. 4932:1973 or equivalent, in sizes to minimize the frequency of joints, should be employed.

- Duct tape, foam agent and spray adhesive should be capable of sealing joints of adjacent sheets of polythene, facilitating attachment of polythene sheets to finished and unfinished surfaces, and adhering under both wet and dry conditions, including during the use of amended water.

- Wetting agent for preparing amended water to enhance penetration should be 50% polyoxyethylene ester and 50% polyoxyethylene ether or equivalent, and diluted to a specific concentration in accordance with the manufacturer's instructions.

- HEPA-filtered appliance means an appliance such as an air mover or a vacuum cleaner fitted with a high efficiency particulate air filter capable of trapping and retaining 99.97% of particles (asbestos fibres) greater than 0.3μm mass median aerodynamic equivalent diameter.

- Water-based polyvinyl acetate (PVA) adhesives for spraying onto exposed surfaces during final clean-up of work area should be able to bind traces of asbestos that may still be on the exposed surfaces. The adhesives should be dyed, say red, to indicate where (and whether) they have been applied to facilitate cross-checking at a later stage.

- Polythene sheet, transparent or colour-coded bags and containers used for packing of asbestos waste should meet the specifications given in the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste issued by the Secretary for the Environment, Transport and Works.

- Respiratory protective equipment and protective clothing used for asbestos abatement work should comply with the requirements of the Factories and Industrial Undertakings (Asbestos) Regulation enforced by the Labour Department.

- Joints and ends of ladders and scaffolds used in the contaminated work area should be sealed with tape to prevent incursion of asbestos fibres.

- Portable water sprayer for applying amended water in a fine mist should be of airless type and with capacity of 10 to 20 litres.

2.2 Documentary proof on the safety and specifications of the above materials and equipment may be required for submission to the Authority for endorsement.

3 Site Preparation

3.1 The proposed work area, that is, the area containing asbestos containing materials to be worked on or removed, should be vacated prior to any site preparation work. Warning notices in English and Chinese (see Appendix 1) should be displayed outside the segregated area in a conspicuous place on the first day of site possession and should remain posted until work acceptance test is satisfactorily concluded.

3.2 A designated secure place outside the work area should be identified solely for transit storage of bagged asbestos wastes. This place should bear adequate warning notices and particular attention should be given to maintain good fire safety measures.

4 Decontamination Facility

4.1 For work area larger than $15m^2$, a 3-chamber decontamination unit should be constructed to provide safe access and egress for authorised working personnel, and for the exit of bagged asbestos wastes and equipment in special circumstances when the provision of a separate debris port is not possible. A reduced, 1-chamber decontamination unit may be acceptable for asbestos abatement work of a smaller scale. Also, depending on the size of the job and its proximity to other occupants of the premises, an induced draught ventilation system may be required for the decontamination unit by fitting a HEPA-filtered air mover at the dirty end of the unit.

4.2 Construction details of a decontamination unit are as follows.

- The decontamination unit will consist of three sealable compartments of progressively lower fibre burden, namely the dirty room, the shower room and the clean room. Each compartment should have a minimum size of 2m (height) x 1m (width) x 1m (length). Floor area of the shower room should be $1m^2$ for every shower head provided.

- The unit may either be of a prefabricated design which should have been thoroughly cleaned and decontaminated before re-use, or be constructed on site with 3 individual layers of plastic sheet with sealed taped joints supported on suitable framing.

- Each compartment should be separated by a curtained doorway consisting of a polythene sheet with an I-shaped slit opening covered by a plastic flap which hangs and lifts in the direction of access. The plastic flap should have an

overlap of at least 100mm on each side of the slit opening and be weighted at the bottom.

- The shower room should be constructed and tested against water leakage and fitted with a tray of adequate size to collect waste water. Hot and cold water adjustable at the shower should be provided at a minimum of one shower head per 6 workers calculated on the basis of the largest shift. All waste water should be taken by a sump pump through pipework and hosing to an aquarium type filter unit to remove suspended particles down to 5μm before being discharged to covered soil drainage system or drummed and then properly disposed. The sump pump should be switched on while the facility is in use to prevent overflow of waste water. The electrical fittings and installations should be so installed and protected as to eliminate any possibility of electrocution.

- The shower room should be wet cleaned and HEPA vacuumed before each shift change and meal break.

- Correct procedures for entering and leaving each compartment are summarised in Appendix 2. A warning sign to approved details as given in Appendix 3 should be posted at eye level at the clean entrance of the unit.

4.3 Where practicable, a separate, 2-chamber debris port consisting of a clean room and a washing room fitted with cold water supply and waste water filtration facility should be constructed for controlled transfer of bagged wastes and equipment. Each compartment should have a minimum size of 2m (height) x 1m (width) x 1m (length). This debris port is normally sealed and used only during the period of active waste and equipment transfer. A warning sign (see Appendix 3) should be posted conspicuously at the entrance of the clean end.

4.4 The procedures for waste and equipment transfer are as follows:

- Before entering the debris port, external surface of the bagged waste or the bagged equipment should be cleaned by HEPA vacuuming and wet-wiping in the work area. The bag should be further decontaminated in the washing room by ‘flushing' with a fine water spray followed by wet-wiping. Worker in the clean room, who should have entered from the uncontaminated side wearing appropriate respirator, gloves and protective clothing, should receive the bag in a 0.15mm thick transparent plastic bag which should then be vacuum packed and goose-neck sealed with tape. The doubled bagged waste should be

transferred immediately to the waste transit store and should not be stacked more than 3 bags high.

- Worker in the clean room must not enter the washing room. Upon completion of work, he should discard his protective clothing and gloves as contaminated waste and exit by the clean room.

- The washing room should be wet cleaned twice using amended water upon completion of waste and equipment transfer. When the main decontamination unit alternates as a debris port, the shower room should be washed immediately with cloth saturated with a detergent solution prior to wet cleaning.

5 Preliminary Decontamination

5.1 Prior to masking the work area with plastic sheet, the area should be pre-cleaned using HEPA-filtered vacuum cleaner and wet-wiping method. Fixed objects which remain within the work area should be cleaned and sealed with 2 layers of plastic sheet to protect them from re-contamination.

5.2 After the preliminary decontamination work and a visual inspection by the registered asbestos contractor to verify that the area is uncontaminated, the floor up to at least 1.5m away from the activities should be covered with 2 individual layers of plastic sheet of 0.15mm thickness which should extend, where appropriate, at least 300mm up and be sealed to the wall with adhesive tapes. All wall openings such as windows should be covered and sealed with 2 layers of plastic sheet. For removal of asbestos floor covering, floor sheet will not be required but a continuous 1m high dust barrier sealed to the floor should be constructed around the work area.

5.3 For asbestos removal work on roof of building, tarpaulin windscreen of at least 2m high should be erected around the work area.

6 Asbestos Removal

6.1 All workers should put on approved respirators and full-body protective clothing with hoods and shoe covers. Only non-powered hand tools should be used. Extreme care should be exercised in handling the asbestos containing material to reduce breakage to a minimum. The asbestos containing material should be kept wet throughout by generous application of amended water in a fine mist.

6.2 For removal of corrugated asbestos cement roofing sheets covered with a layer of concrete screeding, the roofing sheets should be separated carefully into manageable sizes for easy handling and packaging for disposal. This should be done by manually chiselling the concrete screeding along the joints of the cement sheets or along a convenient line for separating the cement sheets before taking down the cement sheets with the concrete screeding intact. All debris of concrete screeding so produced should be bagged immediately and disposed of as asbestos waste.

6.3 For removal of asbestos containing vinyl floor tiles, individual tiles should be lifted by scraping manually at the base. The underlying mastic adhesives, which may also contain asbestos, and any adhering remnant of tiles should be completely removed from the floor slab by manual scraping. Alternatively, chemical mastic removers of proven safe formula may be used.

6.4 A portable enclosure constructed with wood strut framing and two layers of plastic sheets may be used for removal of asbestos cement insulation tiles on roof of building if excessive breaking of the tiles cannot be avoided during removal.

6.5 It is important that debris is not allowed to lie around where it may be further broken or crushed. It should be cleared as soon as possible and certainly before the end of each work shift. All debris should be packed, labelled and disposed of in accordance with the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste.

6.6 All personnel, tools, instrument and bagged wastes leaving the work area should be thoroughly decontaminated in the decontamination unit to a condition of no visible debris.

7 Acceptance of Work

7.1 Upon completion of the asbestos removal work, all surfaces in the work area should be cleaned by suitable dustless method such as HEPA vacuuming and wet-wiping.

7.2 The registered asbestos contractor should then perform a thorough visual inspection to ensure that any debris in the form of contaminated items, dust, chips or untreated effluent has been cleared from the work area. A reassurance air test should be carried out by a registered asbestos laboratory and the test should have at least two samples, unless the volume of the enclosed work area is less than $10m^3$ when only one sample would suffice. With that overriding condition, the number of samples required should be at least the whole number next below $(\sqrt[3]{A} - 1)$, where A is determined as follows:

- If the enclosed work area is less than 3m high, or if the enclosed work area is in open space where exposure is only likely to be at ground level, A is the area of the enclosed work area in square metres.

- In other cases A is one third of the volume of the enclosed work area in cubic metres. If there are large items in the work area, their volume may be subtracted from the gross volume before calculating A.

7.3 Sampling should be carried out only after a thorough visual inspection of the work area to establish that it is clean, dry and free from any visible debris. Aggressive sampling techniques should be used to agitate any dust deposit that may be present inside the work area.

7.4 Reassurance air testing is considered satisfactory only when every collected sample is less than 0.01 fibre/ml as determined by phase contrast microscopy. Each homogeneous work area which does not meet this criterion should be thoroughly recleaned using HEPA-filtered vacuum cleaner and wet-wiping method. This process should be repeated until the work area passes the reassurance air test.

7.5 When satisfactory reassurance air test results are attained, all used plastic sheets should be sprayed with PVA, allowed to dry and then disposed of as contaminated wastes in accordance with the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste.

8 Emergency Procedures

8.1 Emergency procedures are site specific and prior assessment of the work area is important in developing suitable procedures to cater for emergencies such as fire, explosion, vandalism, typhoon, and accidents due to slips, trips and falls, working in confined space, electrical hazard, heat stress and exhaustion. All instructions should be brief and concise and should include a layout plan of the work site indicating the location of fire extinguishing equipment and means of escape. The procedures in a written form in both English and Chinese should be posted conspicuously at the entrance of the work area and read and understood by all working personnel.

8.2 If during the course of asbestos abatement work, a worker collapses or some other accidents occur, the victim should follow normal decontamination procedures with assistance from fellow workers before exiting the work area. For life-threatening situations, however, decontamination should take a lower priority and every effort

should be made to ensure the victim receives immediate medical treatment. Any area contaminated during the emergency should be thoroughly cleaned by wet wiping and HEPA vacuuming at the earliest opportunity, and verified by the registered asbestos supervisor before work is allowed to continue.

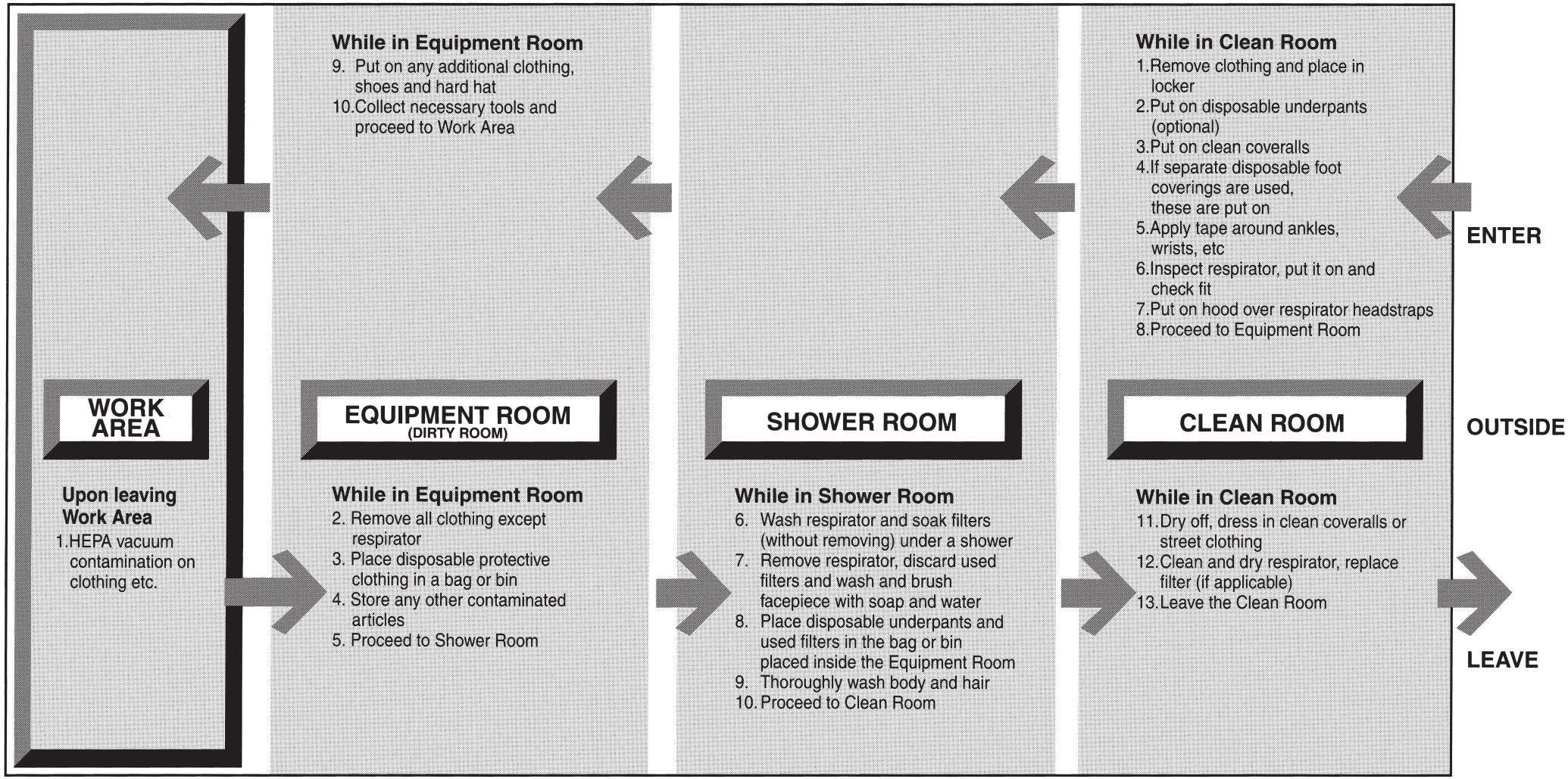
Warning Notice for Posting Outside the Work Site

Specification

The Warning Notice should comprise both warning signs and explanatory labels.

1. Material: Durable, weather-resistant and rigid on a vertical plane outside the work site.
2. Colour:
   (a) For 'DANGER' sign
   Sign: Black lines on yellow background
   Label: Black letters and characters on yellow background
   (b) For 'No unauthorized entry' sign
   Sign: Red lines on white background with the figure in black
   Label: White letters and characters on red background
3. Size:
   Height of sign - Not less than 120mm
   Height of capital letters - Not less than 25mm
   Height of Chinese characters - Not less than 35mm

PROCEDURES FOR ENTERING AND LEAVING DECONTAMINATION UNIT



Facilities:

EQUIPMENT ROOM
(DIRTY ROOM)

*Shelves for additional clothing/ personal protective equipment/boots/tools
*Waste bag/bin for used protective clothing, respirator filters and underpants

SHOWER ROOM

*Cold and hot shower with holder for shower head
*Tray fitted with waste water filtration system
*Liquid soap and shampoo
*Nail brush

CLEAN ROOM

*Mirror
*Storage rack for clean respirator/ protective clothing/towels/shoecovers/ gloves/duct tape
*Locker for personal belonging

Warning Notice for Posting at the Entrance of Decontamination Unit

Specification

The Warning Notice should comprise both warning signs and explanatory labels.

1. Material: Durable, weather-resistant and rigid on a vertical plane at the entrance of the decontamination unit.
2. Colour:
   (a) For 'DANGER' sign
   Sign: Black lines on yellow background
   Label: Black letters and characters on yellow background
   (b) For 'No unauthorized entry' sign
   Sign: Red lines on white background with the figure in black
   Label: White letters and characters on red background
   (c) For 'Wear approved respirator' and 'Wear protective clothing' signs
   Sign: White sign on blue background
   Label: White letters and characters on blue background
3. Size: Height of sign - Not less than 80mm
   Height of capital letters - Not less than 25mm
   Height of Chinese characters - Not less than 30mm

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