



**A GUIDANCE NOTE ON THE
SAFE HANDLING OF SMALL QUANTITIES
OF INTACT CORRUGATED ASBESTOS CEMENT SHEET**

(A supplement to the Code of Practice on Asbestos Control

***“Safe Handling of Low Risk Asbestos Containing Material”*)**

**Asbestos Management and Control Section
Environmental Protection Department**

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<PREFACE>

This *Guidance Note on Safe Handling of Small Quantities of Intact Corrugated Asbestos Cement Sheet (CACS)* provides advice on the streamlined procedures of handling specific CACS to registered asbestos professionals, i.e. 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 Air Pollution Control Ordinance (Cap. 311). The registered asbestos professionals should note this Guidance Note is a supplement to the Code of Practice on Asbestos Control “*Safe Handling of Low Risk Asbestos Containing Material*”.

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1 Introduction

- 1.1 This Guidance Note (GN) provides guidance and advice to registered asbestos consultants, contractors, supervisors and laboratories on safe handling of small quantities of intact corrugated asbestos cement sheet (CACS).
- 1.2 CACS is non-friable in nature, that is, the material cannot be crumbled, pulverized or reduced to powder by hand pressure. Asbestos fibres in the material are bonded into the cement matrix, therefore under normal handling, the quantities of asbestos fibres that can be released, if any, should be insignificant to present a health risk.
- 1.3 In 1997, the Environmental Protection Department (EPD) published a Code of Practice (CoP) on Asbestos Control "*Safe Handling of Low Risk Asbestos Containing Material*" which applies to low risk CACS. In the light of the experience gained in handling of low risk CACS over the past years, the EPD has reviewed the situation and identified that some commonly found CACS can be abated by using a streamlined and cost effective method whilst safeguarding the general public from the potential risk of asbestos fibre release. This GN on Asbestos Control "*Safe Handling of Small Quantities of Intact Corrugated Asbestos Cement Sheet*" aims to provide advice to Registered Asbestos Contractors / Supervisors on adopting a streamlined arrangement for the removal of a well-defined scope of CACS. For other types of CACS not covered by this GN, the standards stipulated in CoP on Asbestos Control "*Safe Handling of Low Risk Asbestos Containing Material*" shall still apply.
- 1.4 The scope of this GN is limited to low risk CACS¹ which satisfy all of the following conditions:
- The CACS is in intact form and good condition;
 - The CACS is not within a fire site;
 - The CACS is not covered with any form of screeding² (e.g. cement / asphalt);
 - The removal of CACS can be conducted simply by dismantling piece by piece and must not involve any breaking; and
 - The total size of CACS is not more than 15 m² and the work must be conducted in one work zone. Splitting of work zone is not allowed.
- 1.5 Typical examples of the CACS to which this GN is applicable are commonly used in canopies or farmlands which are in intact and good condition. On the other hand,

¹ Despite that the vast majority of asbestos cement sheets are in corrugated shape, i.e. commonly known as CACS, this GN also applies to the asbestos cement sheets in plain or other shape when the conditions specified in Section 1.4 are met.

² Cement / concrete used as adhesive between CACS and wall is excluded.

this GN is not applicable to CACS roof sheets or CACS with screeding (e.g. cement / asphalt). Appendix 3 and Appendix 4 depict the examples of CACS to which this GN is and is not applicable, respectively.

- 1.6 The measures and procedures described in this GN are the minimum requirements necessary for safeguarding the environment and the health of occupants of areas where CACS removal, within the defined scope, is to be carried out. In any case where there is doubt about whether the concerned CACS falls within the classification in Section 1.4, the existing CoP on Asbestos Control “*Safe Handling of Low Risk Asbestos Containing Material*” shall be followed for safe handling.

2 Materials and Equipment

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

- For preparation of work area, transparent polythene 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 a vacuum cleaner fitted with a high efficiency particulate air filter capable of 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 (e.g. plastic sheet) 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*” published by the EPD.

- 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 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 a capacity of 5 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 CACS 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 work site in a conspicuous place on the first day of site possession and should remain posted until work acceptance procedure 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 in accordance with the Code of Practice on the “*Handling, Transportation and Disposal of Asbestos Waste*”.

4 Decontamination Facility

- 4.1 For CACS which satisfy the conditions given in Section 1.4, a 1-chamber decontamination facility is acceptable for the given asbestos abatement works. The construction details of the 1-chamber decontamination facility are described as follows:
- 4.1.1 The decontamination facility will consist of one sealable compartment which should have a minimum size of 2m (height) x 1m (width) x 1m (length).
- 4.1.2 The decontamination facility 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 polythene sheet with sealed taped joints supported on suitable framing.
- 4.1.3 The decontamination facility should consist of a curtained doorway made of polythene sheet with an I-shaped slit opening covered by a plastic flap with hangs and lifts in the direction of access. The plastic flap should have an

overlap of at least 100 mm on each side of the slit opening and be weighted at the bottom. A warning sign to approved details as given in Appendix 2 should be posted at eye level at the clean entrance of the facility.

4.1.4 The decontamination facility should contain the following items:

- A plastic bucket filled with clean water (about 5 to 10 litres);
- Polythene sheet for laying on the ground of the decontamination facility;
- Sufficient supply of clean cloth;
- HEPA vacuum cleaner; and
- Waste bag.

4.1.5 The decontamination facility should be wet cleaned and HEPA vacuumed before each shift change.

4.2 The procedures for personal and equipment decontamination are as follows:

- Prior to commencing asbestos abatement work, place the polythene sheet on the ground at the decontamination facility. Place all decontamination equipment on the polythene sheet;
- On completion of asbestos abatement work, all tools, instrument and bagged waste leaving the work area should be thoroughly decontaminated inside the decontamination facility;
- Remove the shoe covers before entering the decontamination facility from the work area;
- The worker shall stand on the polythene sheet inside the decontamination facility and soak the cloths, wring them out and fold, then clean equipment, tools, working shoes and bagged waste. Re-fold the cloth so a clean surface is outer most and re-wipe the tools, equipment, etc. Dispose of the cloth in the waste bag. **DO NOT** re-soak a used cloth in the bucket of water since this will contaminate the water supply;
- Use the HEPA vacuum cleaner with a brush attachment to clean coveralls or use a wet clean cloth in a patting motion to clean the coveralls. Once again, used cloths must not be re-soaked in the water supply;
- Gently peel off the coveralls ensuring that they are pulled off inside-out. Gently fold up and place the coveralls in the waste bag;
- Wipe clean the decontamination facility with clean wet cloths and place all in the waste bag and goose-neck seal the waste bag with duct tape;

- Wipe clean the respirator with a clean wet cloth and take off. Place the used filters in the waste bag. Clean the mask thoroughly with a wet cloth inside and out. For improved hygiene, a disinfectant wet-wipe can be used to clean the inside of the mask. Place the cleaned mask in a sealable plastic bag for re-use; and
- The water in the bucket should not be contaminated as long as wet cloths have not been re-used and the water can be disposed of without further precaution.

5 Preliminary Decontamination and Setup of Air Test

- 5.1 The requirement for any preliminary decontamination will depend on the CACS occurrence.
- 5.2 Preliminary decontamination shall be carried out in every situation where it is possible that CACS debris may have fallen down from the sheet and be lying on the floor or any horizontal surfaces beneath. Typical scenarios for preliminary decontamination include the following:
 - 5.2.1 CACS canopy: decontaminate window ledges, air conditioners etc., lying beneath the canopy.
 - 5.2.2 CACS in farmland or lying loose on floor: no requirement on preliminary decontamination
- 5.3 Preliminary decontamination shall be carried out by workers wearing coveralls and respirators. Prior to masking the work area with polythene sheet, the area should be pre-cleaned using vacuum cleaner and wet-wiping method. The floor beneath/adjacent to the CACS and any horizontal surfaces to fixed objects beneath CACS should be visually inspected for debris. Any debris present should be collected and placed in waste bags. All surfaces beneath or adjacent to the CACS shall be wet-wiped clean. The wet cloths shall be placed in a waste bag.
- 5.4 Preliminary decontamination in the case of CACS in rural settings such as shuttering to access paths and field irrigation channels is not required since the adjacent soil shall be treated during the asbestos abatement works in accordance with the requirements set out in Section 6.4.
- 5.5 After preliminary decontamination, the floor / ground up to at least 1.5m away from the activities should be covered with 2 individual layers of polythene 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 polythene sheet (Passage to work zone is excluded).

- 5.6 For removal work of CACS canopy on roof of buildings, a tarpaulin windscreen at least 2m high should be erected around the work area.
- 5.7 Once the setup of the work area for the asbestos abatement work is completed, the Registered Asbestos Laboratory shall collect one air sample inside the work area (i.e. work area air test). The sampling period, which is normally two hours, shall cover the duration of the removal of CACS and their debris as well as cleaning of the work area³.

6 Asbestos Removal

- 6.1 No breakage of CACS is allowed. If breaking is necessary at the adjacent structure (e.g. rusted metal part which cannot be removed without hammering or chiseling, or cement / concrete used as adhesive between CACS and walls), the work shall be done only to the non-asbestos parts and should be kept to a minimum. All working parts should be thoroughly wetted and only non-powered hand tools are allowed to perform such work.
- 6.2 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.
- 6.3 Removal of CACS canopy
- 6.3.1 Wet the fasteners or bolts before the removal of CACS. Remove and collect the fasteners or bolts carefully for disposal as asbestos waste. If the fixture or bolts cannot be easily removed, cut the fixture while avoiding contact with the CACS.
- 6.3.2 Loose CACS should be removed in one piece and carefully handled for wrapping in polythene sheet. Every effort should be made to keep the individual sheets horizontally to prevent any dirt and debris from the top surface falling off – this will minimise fibre release and reduce the amount of clean-up required of the work zone on completion of work. To avoid breakage of the CACS, the CACS shall not be dropped onto the ground or rubble chutes shall be used to transfer CACS to the ground.
- 6.3.3 After the CACS has been removed, all the supporting materials (e.g. metal frame) shall be cleaned thoroughly. Metal components shall be cleaned by wire brushing, wet-wiping and vacuum cleaning.

³ In case the work area air test is completed prior to the clearance of the work area (i.e. the asbestos abatement work takes more than two hours), the Registered Asbestos Laboratory should perform an additional reassurance air test.

6.4 Removal of CACS in rural setting

- 6.4.1 For CACS used as shuttering to access paths and in fields, after the removal of the concerned CACS, the soil immediately adjacent to the CACS should be collected using a hand trowel and disposed of as asbestos waste if visible asbestos debris is present.
- 6.4.2 Where CACS has been used as shuttering, the adjacent concrete surfaces should be wetted then wire brushed and wet-wiped clean. If CACS debris still adheres to some areas of concrete, the concrete should be removed using a hand chisel and the debris shall be disposed of as asbestos waste. Do not chisel on CACS surface.
- 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 the work shift. All CACS and their 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 After completion of removal works, the covering polythene sheet on walls and floor of the work zone should be wet wiped clean and then sprayed with PVA adhesives before being gently folded inwards and disposed of as asbestos waste.
- 6.7 All personnel, tools, instrument and bagged waste leaving the work area should be thoroughly decontaminated in the decontamination facility. Section 4.2 describes these procedures.
- 6.8 After completion of work area air test, the Registered Asbestos Laboratory shall collect the air sample, conduct the analysis by phase contrast microscopy and report the result to the on-site Registered Asbestos Supervisor.

7 Acceptance of Work

- 7.1 The Registered Asbestos Contractor / Supervisor shall perform a thorough visual inspection to ensure that any debris in the form of contaminated items, dust, chips or contaminated water has been cleared from the work area. The acceptance criteria are a work area that is clean, dry and free from any visible debris. This should be well documented with photos in the completion report to be submitted to the Authority.
- 7.2 The Registered Asbestos Laboratory shall report the work area air test result to the on-site Registered Asbestos Supervisor once the result is ready. Work area air test is considered satisfactory only when the collected sample is less than 0.01 fibre/ml as determined by phase contrast microscopy.

- 7.3 When satisfactory work area air test result (and / or reassurance air test) is 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*”.
- 7.4 If the work area air test result is not less than 0.01 fibre/ml, the work area shall be thoroughly re-cleaned using HEPA-filtered vacuum cleaner and wet-wiping method. A reassurance air test inside the work area shall then be carried out by a Registered Asbestos Laboratory. Sampling shall only be carried out after a thorough visual inspection of the work area by the Registered Asbestos Contractor / Supervisor 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.
- 7.5 This process shall be repeated until the work area passes the reassurance air test and the Registered Asbestos Contractor / Supervisor can then carry out the site clearance in accordance with Section 7.3.

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. The procedures in a written form in both English and Chinese should be posted conspicuously at the entrance to the work area and read and understood by all working personnel.
- 8.2 If, during the course of asbestos abatement work, an accident occurs involving personal injury, the victim should follow normal decontamination procedures in accordance with the requirements set out in Section 4.2 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 vacuum cleaning at the earliest opportunity, and verified by the Registered Asbestos Supervisor before work is allowed to continue.
- 8.3 Prior to the asbestos abatement work, the Registered Asbestos Supervisor shall check the integrity of the CACS if they can meet all the conditions stated in Section 1.4 and that no breaking of the CACS will be required during the subsequent removal works. Otherwise, the asbestos abatement work shall follow the procedures stipulated in CoP on Asbestos Control “*Safe Handling of Low Risk Asbestos Containing Material*”. During the course of asbestos abatement work, if CACS debris other than the conditions stated in Section 1.4 were found, workers shall stop the work immediately and inform the Registered Asbestos Supervisor. Repeat the preliminary decontamination procedures in Section 5.3 and clear the CACS debris accordingly. The Registered Asbestos Contractor / Supervisor shall perform a

thorough visual inspection to ensure all the CACS debris has been cleared and then continue the asbestos removal work in accordance with the requirements set out in Section 6.

Appendix 1. 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

Appendix 2. Warning Notice for Posting at the Entrance of Decontamination Facility



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 decontamination facility.
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

Appendix 3. Examples of CACS to which this GN is applicable

The following photographs show typical occurrences of CACS that meet the requirements as detailed in Section 1.4.



CACS canopies to buildings not more than 15m² in total size.



CACS not more than 15m² in total size lying on the ground, which are in intact form and good condition.



CACS used as fence sheet not more than 15m² in total size, which are in intact form and good condition.



CACS used to line irrigation channels and paths in fields, which are in intact form and good condition.

Appendix 4. Examples of CACS to which this GN is not applicable

The following photographs show typical occurrences of CACS that do not meet the size and/or condition requirements as stated in Section 1.4 and they shall be abated in accordance with CoP on Asbestos Control “*Safe Handling of Low Risk Asbestos Containing Material*”.



CACS are not in intact form or good condition.



CACS rooftop / roof sheet.



CACS roof covered with a layer of cement screeding.



CACS roof is associated with other ACMs (An asbestos cement flue as shown in the example above).