

RELEASE OF ASBESTOS FIBRES IN SYSTEM BUILT SCHOOLS

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PART 1: THE PROBLEM. REMEDIAL MEASURES

Summary

1. Many System built schools are typical 1940's to 1980's flat roofed square buildings with large areas of windows. Asbestos was used extensively in their construction particularly between 1945 to the early 1980's. It was used in walls, and ceilings, as cladding around critical structural components, as lagging and firebreaks and as a general building board. It was not unusual during construction for asbestos debris and off-cuts to be left in the ceiling voids or to be swept into the wall and column voids.
2. Over the years the asbestos has deteriorated releasing fibres into the voids and rooms. In addition the replacement of windows, running of cables, installation of white-boards, computers and other equipment has disturbed the asbestos, as has old age, water ingress, vandalism, fair wear and tear, vibration, botched maintenance, the lack of maintenance and inadequate asbestos management.
3. If air can enter a room through a crack, hole or gap then asbestos fibres can enter the room just as readily.
4. In 1987 air tests were carried out in a System built school in London which found that when a door was slammed or when a wall was hit very high levels of asbestos fibres were released into the rooms. Most of the asbestos was amosite, which is 100 times more dangerous than chrysotile. Regrettably cumulative exposure at the levels can cause mesothelioma, and children are particularly vulnerable. Despite the serious nature of these findings and the widespread implications, it appears that nothing was done to solve the problem in thousands of other similar schools. Therefore for the next twenty years the release of asbestos fibres continued unabated in schools throughout the country from common everyday activities.
5. In July 2006 the problem was rediscovered. Air sampling was carried out in a System built school in Wales which found that when the doors were slammed, walls and interior columns were hit, when windows were banged shut and when people sat on window sills that high levels of asbestos fibres could be ejected out of cracks and gaps into the classrooms and also into the ceiling void. Once again most of the asbestos was amosite.
6. The two sets of tests gave definitive evidence that normal everyday boisterous activities that one can expect in a classroom produce airborne asbestos fibre levels that are at times above the Control Limit. That limit is designed for asbestos contractors who by law have to wear breathing apparatus and protective overalls and any work carried out has to be within a negative pressure sealed enclosure.
7. The schools in Wales were CLASP buildings which is a particular type of System building. Once the problem had been re-identified further air sampling was carried out in other CLASP buildings of the same Mk. It was later realised that the problem extended to many other types of System built schools throughout the country, as had been proved some twenty years before.

8. There are over 26,000 schools in the UK, and according to Scape¹ about half of them are System built. There are many makes and types of System built schools including amongst others over 3,000 CLASP buildings, most of which are schools, 2,000 SCOLA and 400 Hills schools. Many System schools built between 1945 to the early 1980's could have similar problems.
9. HSE, the Department for Education, the Local Government Employers and Scape recommended remedial measures that entailed identifying the extent of damaged asbestos material, debris and fibres. They then recommended sealing every gap in the walls, skirting boards and internal structural column casings. They acknowledged that it was not unusual to find asbestos off-cuts in the ceiling void, and that further contamination of the area could occur from asbestos fibres being ejected from the tops of the wall voids and column casings. They therefore recommended that these should be sealed with expanding foam and the ceiling void should then be sealed to prevent any further release of fibres into the rooms.
10. In December 2006, five months after the discovery in Wales, the HSE "CLASP Working Group" was set up in to examine the extent of the problem and to determine the effectiveness of the remedial measures in reducing the fibre release. In the light of their findings in March 2007 they issued guidance recommending remedial measures.
11. The "CLASP Working Group" recommendations and guidance are seriously flawed. They ignore much of the good advice that had previously been given. At times they recommend dangerous practice, which if followed will inevitably expose the people carrying out the work to unacceptable levels of asbestos, it will contaminate the halls, corridors and classrooms and will consequentially lead to the exposure of the occupants of the rooms.
12. The CLASP Working Group guidance recommends sealing gaps in the columns throughout every school to prevent any asbestos fibres being released into the classrooms. The damaged asbestos materials, AIB off-cuts, asbestos debris and fibres remain in the wall and column voids, and unless a meticulous environmental clean and extensive sealing has taken place in the ceiling void, and walls asbestos contamination will remain with the potential to filter into the rooms. Every time a child runs into a wall or knocks into a column, slams a door or sits on a window sill asbestos fibres will be released into the voids. The asbestos fibres are only prevented from escaping into the classrooms, hall and corridors by strips of silicone sealant and sticky tape. If any sealant becomes unstuck, or just one curious child removes a strip of sealant then the asbestos fibres will once again enter the rooms.
13. Air samples were taken in schools before remediation to assess the levels of airborne fibres. Consistently raised levels were found when doors and windows slammed and walls and columns hit. These were reported in the 1st HSL report. Further tests were then carried out in classrooms and offices selected by HSL and the Local Authorities which found almost no asbestos fibres at all. These results were reported in the 2nd HSL report.

¹ Scape System Build Limited is a Local Authority Controlled Company. It started business in April 2006 and is the trading company for the CLASP Consortium, For more detail consult the Scape web site www.scapebuild.co.uk and the CLASP web site www.clasp.gov.uk.

14. Further tests were taken after the columns had been sealed. In some schools the remedial measures significantly reduced the fibre release, in others asbestos fibre levels remained unacceptably high.
15. It can only be concluded that schools with damaged and deteriorating asbestos will have high levels of airborne asbestos fibres in the rooms before remedial measures are taken. Sealing the gaps and cracks reduces the fibre release but does not eliminate it, indeed at times the levels are above the legal limit for a certificate of reoccupation to be issued. The levels in some schools remain unacceptable and are cumulatively dangerous.
16. There is such a fundamental difference between the results from the series of tests reported in the 1st HSL report and the 2nd that HSE have been asked under the Freedom of Information Act how, and by whom, the schools and offices were selected. They have refused to disclose the information. It is possible that the buildings were under the control of the shareholders of a commercial company Scape System Build Ltd. If that is proved to be the case then there are commercial and financial implications which puts into question the neutrality and credibility of the second series of tests.
17. In many of the tests in the 2nd HSL report both before and after remediation no asbestos fibres were found, in others just one asbestos fibre was identified. Despite these very low asbestos fibre concentrations HSE further reduced the apparent fibre levels by pooling the results. This in effect treats all the different air samples as one, and if taken consecutively or concurrently in the same room can justifiably be used to increase the analytical sensitivity of the samples. However in these tests the results were pooled from different rooms, different schools, sampled at different times, different months, even different years. All of which runs contrary to the whole concept and purpose of pooling. Because of this HSE and HSL were able to make remarkable claims that the levels in the offices and schools were lower than had been previously identified, indeed the levels were lower than fresh air. The misuse of the data has given results that are significantly lower than the tests actually achieved. Based on these results, statements have been made and presentations given by senior HSL and HSE officers that cannot be justified.
18. It appears that the CLASP Working Group based its decisions, conclusions and recommendations on the exceptionally low results from the 2nd HSL report and ignored much of the previous evidence of raised fibre levels. The decisions, conclusions and recommendations of the CLASP Working Group are consequently flawed.
19. The results from the 2nd HSL report have been used by HSL, HSE and Government Ministers to claim that there is no evidence that teachers and children have been exposed to dangerous levels of asbestos. When regrettably in many schools the very opposite is true.
20. In December 2007 air sampling was carried out in a CLASP school as part of an ITN investigation. This was more than a year after all local authorities had been instructed to check their CLASP schools and seal any gaps, it was also two months after HSE should have completed their checks to ensure that they had. Air sampling measured dangerously high asbestos fibre levels. The local authority had done nothing to identify whether they had a problem and nothing to reduce the asbestos fibre release. Until it was brought to their attention by the

ITN report, HSE had failed to identify that the local authority were ignoring crucial guidance that put the safety of the occupants of their schools at risk.

21. It is probable that other schools are in a similar position.
22. Throughout the country in schools where the asbestos is in poor condition even if the most stringent measures are taken and rigorous inspections are carried out to ensure that all the seals are effective, the measures can only be considered as temporary. Where there is a problem the sealing does not solve the problem it just hides it.
23. For more than twenty years it has been known that common boisterous activities can release dangerous levels of asbestos fibres into the classrooms, corridors and halls. However until recently the problem has not been addressed, indeed over time it is inevitable that it has worsened. As a consequence an unknown number of staff and children have been exposed to unacceptable levels of asbestos fibres in our schools over the course of many years, in some cases over the course of decades. That exposure has to be stopped. There is no easy solution, the only safe measures are to either remove all of the asbestos completely or to build new schools.

This Paper

24. This paper examines the method and extent of asbestos fibre release from common everyday activities in System built schools. It puts the various fibre levels into perspective so that people can have a better understanding of the terminology and science used when defining asbestos fibre levels. It gives a time scale of when authorities first realised that there was a problem, and the actions taken. It then assesses the effectiveness, or otherwise, of the recommended remedial measures. It compares the fundamental differences between two sets of air tests that were carried out to establish the levels of asbestos fibre release both before remedial actions had been taken, and after. It examines the various official guidance and reports, and gives a detailed criticism of the "CLASP Working Group" guidance and recommendations for remedial measures. It offers recommendations that improve on and strengthen the official guidance. It also examines the actions and decisions of Government Ministers, the HSE and The Department for Education and their failure to adequately address the problem.
25. It should be noted that this paper has been written to specifically address a particular problem of asbestos release in System built schools. It is not intended to address the wider issue of asbestos in schools.

Release of asbestos fibres in system buildings.

26. Twenty years ago in May 1987 the Inner London Education Authority conducted air sampling in a System built school in Wandsworth and found high levels of asbestos fibres were released when the door was slammed five times. The level was 0.33f/ml. The report states:

"Scientists commissioned by Inner London Education authority carried out experiments at Ernest Bevin school in Wandsworth, where there are over 400

separate incidences of asbestos. These suggest that even when supposedly sealed in by painting, asbestos panels are still hazardous.

*Slamming a door five times resulted in measurements averaging 330 fibres per litre of air: that is 33 times higher than the safety limit set by the Health and Safety Executive."*²

27. During the same series of tests air sampling was carried out to determine airborne fibre levels that could be released from unsupervised secondary school boys kicking and bumping into a wall with asbestos panelling. The level of fibre release was up to eighty seven times greater than the Clearance level, the safety level set by the HSE. The report states:

*" From the results of the tests it has been demonstrated that airborne fibre concentrations in the range 0.16 to 0.87 fibres/ml can be generated by repeated kicking of asbestos panels, and by the slamming of doors in close proximity to the panels. Analysis of the fibres by electron microscopy has confirmed the majority of the fibres to be amosite asbestos."*³

28. In the intervening twenty years the lessons were not heeded, they were forgotten. However the release of asbestos fibres continued at dangerous levels in schools throughout the country from everyday occurrences.
29. In 2006 it was rediscovered that hitting a wall three times could release amosite fibres above the Control limit. Other CLASP schools in the Rhondda Cynon Taff were investigated to see whether they had similar problems. Air sampling was carried out which determined that slamming doors and windows released significant levels of amosite fibres, as does sitting on the window sills. It is thought that when the walls and columns were hit they acted as bellows and forced fibres through the cracks in walls and column casings.
30. It was also found that Asbestos Insulating Board (AIB) off cuts and debris had been left in the ceiling void and wall voids from when the schools had been built in the 1960's, gradually deteriorating over the forty years and releasing asbestos fibres. Botched maintenance had damaged the AIB, as had the running of cables through the column cladding and the fastening of electrical sockets and other fixtures to the cladding had further damaged the AIB. The windows had also been replaced by fastening to the column cladding by being screwed through the AIB. As the windows flexed it is thought that the screws acted as files so releasing more fibres into the column and wall voids.

Asbestos extensively used in schools

31. 13,000 schools were built between 1945 and 1975 when the use of asbestos was at it height, many of these schools contain large amounts of asbestos in their structure.⁴ Other schools were refurbished during the same period with extensive use of asbestos materials. From the mid 1970's onwards asbestos use gradually declined, after 1985 far less was being used in schools and the import of most

² Dust to Dust Eddie Rowe Trade unions technical advisor ILEA Asbestos Joint Working Party 27 Nov 1987

³ ILEA report LSS/AP/52 (1987) Investigation into fibre release from low level asbestos panels - Ernest Bevin school May 1987

⁴ HSE Briefing HSE Head of Asbestos Policy to local authorities Forum 23 Nov 2004

dangerous types amosite and crocidolite were banned, although chrysotile was not banned until 1999 and its use continued until stocks were used up.

32. Many of the schools built post war are System built. Scape state:

*"About half the school buildings in the UK are constructed using a building System. Most of the System built schools were constructed in the 60's and 70's."*⁵

33. System built is a term commonly used for schools and other buildings that are built to specific parameters so that parts can be prefabricated in a factory and assembled rapidly on site. Intentionally they use materials and components that can be bolted and screwed together, normally with minimal use of the "wet trades" such as brick laying or plastering. Normally a light steel structure will be clad with panels that are bolted in place. Some schools use a concrete structure, others aluminium or even wood. Visually it was typical for the schools to have flat roofs and large expanses of windows. "System" build is also referred to as "Modular build."⁶ Many system built schools have not been well maintained and are deteriorating. As the schools have deteriorated so has the asbestos.

34. Annex 2 gives details of different types of System built schools.

Some common uses of amosite and crocidolite in schools

35. Chrysotile (white) asbestos can cause asbestos disease including mesothelioma. Amosite (brown) is 100 times more likely to cause mesothelioma and crocidolite (blue) is 500 times more likely to do so.⁷ Mesothelioma can be caused by very low level exposure to asbestos, particularly to amosite and crocidolite.⁸

For further information see www.asbestosexposureschools.co.uk)

36. The following are some of the more dangerous, but commonly used types of asbestos in schools:

Sprayed asbestos

Some schools contain sprayed asbestos.

- Asbestos was sprayed or trowelled onto steel structures and surfaces such as the undersides of roofs as a fireproofing, sound and thermal insulation. It is known to have been sprayed onto structural columns in System built schools.
- Until 1974 sprayed asbestos contained all types of asbestos. Crocidolite was the major type used until 1962⁹ and it was extensively used until 1970.¹⁰ Chrysotile and amosite were also used. Asbestos content is up to 85%.

⁵ Scape System Build Ltd School Guides, School building Overview, Building Systems. www.scapebuild.co.uk

⁶ School building programmes Motivations consequences and implications University of Newcastle upon Tyne CfBT Research and Development. Building systems and portable buildings 1.226 1984 1-252 1980.

⁷ The Quantitative risks of mesothelioma and lung cancer in relation to asbestos exposure Hodgson and Darnton HSE Statistics Unit Ann Occup Hyg Vol 44 No 8 pp 565 -601 Jun 2000

⁸ HSE Statistics. Asbestos FAQs Is there a safe level of exposure below which there is no risk? Not dated, downloaded 23 Oct 2006

⁹ HSE MDHS100 Surveying sampling and assessment of asbestos-containing materials. Table 1 p10

- Most of this very friable asbestos is concealed in voids.
- Although many schools have the accessible sprayed asbestos removed over the years, much of the inaccessible material remains. Some removals have been carried out in an unprofessional manner so leaving very friable asbestos debris behind.
- Sprayed coatings are vulnerable to accidental damage and also to delamination due to water leakage releasing debris onto floors and ceilings.¹¹
- Sprayed asbestos deteriorates with age releasing fibres, it readily breaks down if wet. Vermin often damage it, as does vibration, age and maintenance activities.¹² Sprayed asbestos readily releases large quantities of asbestos fibres.¹³

Asbestos lagging

It is common to find asbestos lagging in schools. It has been extensively used for more than a hundred years. It is deteriorating and readily releases asbestos fibres. Some lagging has been removed over the years, particularly from boiler houses, however much remains beneath floors, behind walls and above ceilings.

- Many schools have heating and hot water pipes clad in asbestos lagging or quilts.
- The pipes normally run through the ceiling, floor and wall voids.
- In many schools, much of this material remains.
- The boilers were clad in lagging or quilts, although some of this accessible material has been removed over the years, much of it remains.
- Crocidolite was used from 1890 until 1970, amosite until the late 70s. Chrysotile was also used.
- The content of asbestos in lagging varies between 6-85%.
- Some quilts contain 100% asbestos.¹⁴
- The asbestos in some lagging is reasonably well bound to its matrix, but can still be easily damaged. A cement based matrix breaks down and becomes brittle over time.
- Other lagging is highly friable and very easily damaged.
- It is particularly susceptible to water damage from leaks in pipes or leaks in roofs.
- The material deteriorates with age, or it becomes more friable and then disintegrates.¹⁵
- The very friable type of lagging frequently contains the higher quantities of asbestos.
- When fibres are released in the voids, they will be disturbed by drafts, vibration, impact, maintenance activity and vermin.¹⁶
- Asbestos fibres will readily filter through any crack, however small. If air can pass through a crack, then so can asbestos fibres.
- If a decision is taken to leave asbestos lagging in place and to repair it and encapsulate it, then it must be borne in mind that the very process of repairing and encapsulating the lagging can release as many fibres as complete removal would.

¹⁰ Department of the Environment. Asbestos materials in buildings. 1983 para 4.2

¹¹ HSE MDHS 100 Annex 1 Sprayed asbestos coatings para 2 p24

¹² Department of the Environment Asbestos materials in buildings 1983 PARA 5.6 P18

¹³ HSE MDHS100 Surveying sampling and assessment of asbestos-containing materials. Table 1 p10 CLASP Development Group Asbestos Awareness Handbook. March 2003

¹⁴ Department of the Environment. Asbestos materials in buildings. p13. 1991

¹⁵ Department of the Environment. Asbestos materials in buildings. p34 1991

¹⁶ Department of the Environment Asbestos materials in buildings 1983 PARA 5.6 P18

- In the long run it is safer to remove any lagging. Rigorous controls have to be in place when it is removed as it readily releases large amounts of fibres. Meticulous clean up and clearance testing have to be carried out to ensure that no debris and fibres remain.
- It is important to note that many of the boilers and services to which asbestos containing lagging has been applied are approaching the end of useful life and will need to be replaced in the near future.

Asbestos cloth, ropes and yarns

Asbestos cloth ropes and yarns have been used in schools.

- The "safety curtain " that was lowered onto the stage during the interval in a theatre was usually asbestos cloth. A similar material has been used as firebreaks in ceiling voids in schools.
- The material had to be cut to allow it to be fitted, and subsequently may have been further damaged by pipes and cabling being fitted in the void. All of this would release fibres and debris, much of it remaining after the work had finished.
- Crocidolite, amosite and chrysotile have been used in the manufacture of asbestos cloth.
- Since the 1960s most, but not all, contain chrysotile.
- The asbestos content approaches 100%.

Asbestos insulating board (AIB)

Asbestos insulating board has been widely used in schools.

- AIB typically contains amosite in quantities from 15% to 20% and sometimes up to 40%.
- Some AIB contains a mixture of amosite and chrysotile, older boards contain crocidolite.
- Crocidolite was used in the manufacture of boards until 1965¹⁷ and amosite until 1980, however the use of these boards continued after that as stocks were used up.
- Import of raw crocidolite ceased in 1970, although stocks were used after that. Eternit imported asbestos cement boards containing crocidolite until 1975.¹⁸
- AIB can be readily broken, giving significant fibre release. Also significant surface release is possible by abrasion, by hitting, vibration, bad maintenance practice, vandalism, deterioration through age, vermin, amongst other means.
- Although one side is usually painted or plastered,¹⁹ the reverse side will not be and can therefore release fibres into a wall cavity or ceiling void.
- Window casings (reveals) were specified as AIB in Mkcs of CLASP buildings.
- Many ceilings in school classrooms, corridors, kitchens, toilets and other rooms are AIB. Sometimes when the majority of the ceiling tiles are not AIB the tiles around the perimeter of the ceiling are, such as the strips running along the tops of the window frames.

¹⁷ Department of the Environment. Asbestos materials in buildings. p34 1991

¹⁸ Simpson Report. Vol 1. Para 11. 1979

¹⁹ HSE MDHS100 Surveying sampling and assessment of asbestos-containing materials. Table 1 p11 Department of the Environment. Asbestos materials in buildings. 1983 para 4.2
 Department of the Environment. Asbestos materials in buildings. 1986. Department of the Environment. Asbestos materials in buildings. 1991. Department of Environment Transport and the Regions. Asbestos and man made mineral fibres in buildings. Final draft Aug 1998

- Partition walls can be AIB.
- AIB was frequently used sandwiched between the plaster board internal wall and the exterior wall.
- It was used as window surrounds and as window infill panels beneath the windows.
- It was frequently used to clad the structural steel columns in modular/system buildings. this was common practice on the ground floor but can be found on other floors.
- It was used behind heaters and in heating ducts, and in fire doors.
- Some acoustic tiles (tiles with many small holes in and through the surface) are AIB. Any fibres they release on the top, unprotected surface, can filter down through the holes.²⁰
- Many schools contain AIB. Many contain large amounts. All of it is old.
- When the schools were built, off-cuts of AIB and debris were sometimes swept into the wall voids or left behind in the ceiling voids. All of this material is damaged and friable and will release fibres.
- Materials that contain amosite and crocidolite tend to become more friable with age than materials containing just chrysotile. They become less resistant to mild abrasion and damage thus releasing fibres.²¹ Amosite and crocidolite are released at least ten times more readily from the matrix than chrysotile.²²
- Much of the material has been damaged by vibration, vermin, vandalism, fair wear and tear, botched maintenance, no maintenance, building work, cable laying. By being hit. Much of it has deteriorated over the years. All has the potential to release fibres.²³

Use of Asbestos Insulating Board for protecting structural components in System buildings.

37. Many types of system built schools are based on a light steel structural frame. In the event of a fire the steel columns could buckle and the building would be liable to collapse. Consequently the vertical columns in particular are often clad in AIB. AIB normally contains amosite asbestos and sometimes amosite and chrysotile although Crocidolite was used in the manufacture of boards until 1965²⁴. It is very friable and therefore has been protected by a light metal casing. Sometimes it was glued or screwed to the casing, and sometimes to the column itself. In some schools a material containing amosite was sprayed onto the columns.²⁵
38. Plate one shows the steel structural frame of a typical system built school. Although this is an early CLASP building, the photograph shows the principal of the structure. Plate 2 shows how the vertical columns are protected by AIB cladding and a metal casing. The gap between the AIB and the column is relevant as asbestos debris can fall down this gap. In Plate 3 the metal casing has been removed showing how the AIB is glued to the casing. In the top two casings it has been ripped off at some stage leaving behind friable asbestos debris. Plate 4 shows how the two halves of the metal casing do not meet,

²⁰ Scape Formal Notice. Release of Asbestos fibres in CLASP Buildings. p 3,4,5 12 Oct 2006. CLASP Development Group Asbestos Awareness Handbook. March 2003

²¹ Department of the Environment Asbestos Materials in Buildings 1986 Para 4.9 p 17

²² HSE Amendment to the Control of Asbestos at work regulations 1987 and ACOP July 2002 para A67 p 34

²³ Department of the Environment Asbestos materials in buildings 1983 Para 5.6 P18

²⁴ Department of the Environment. Asbestos materials in buildings. p34 1991

²⁵ HSL Further measurements of fibre concentrations in CLASP construction buildings AS/2007/14 para 3.3.1 p19

consequently the gap allows asbestos fibres to be forcibly ejected when the column is knocked. As there is a gap in the front it is probable that there is a similar gap in the back, however this cannot be examined as the casing in this case was about 5mm from the window frame.

Plate 1: System Build Steel Structural Frame



Plate 2: Column Casing

Note: The casing is approximately six inches square. The join in the front and back where the two halves meet. Note also the air gap between the AIB and the column.

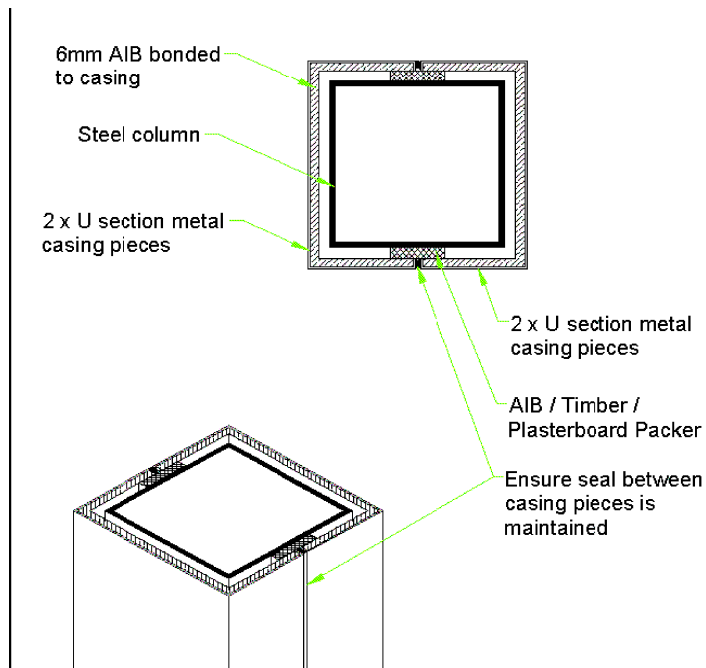


Plate 3: Metal Casing Removed

Note: AIB glued to casing in bottom of photograph. AIB has been removed at some time from the top two casings leaving behind asbestos debris.



Plate 4: Crack in Column Casing

Note: Any asbestos fibres can be readily released through this gap. It is probable that a similar gap is also behind the column adjacent to the window frame.

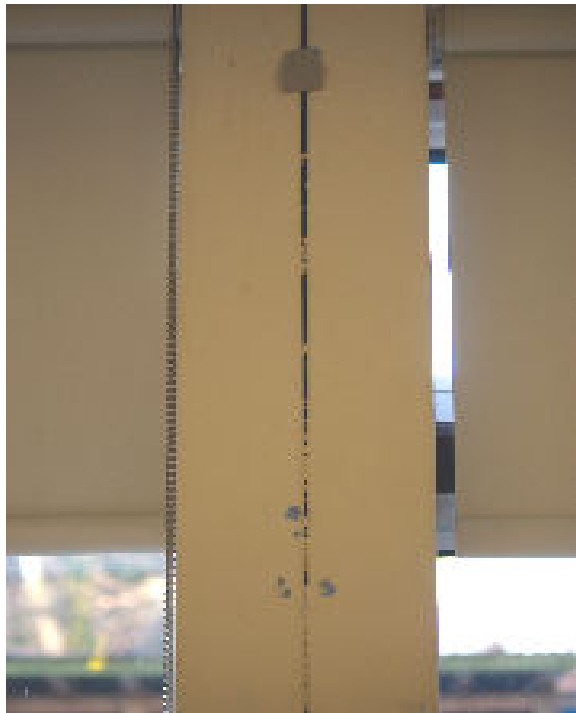


Plate 5: Exposed badly damaged asbestos cladding



Note: It appears that the asbestos cladding has been cut when fitting the shelves. This would release large amounts of asbestos fibres. It is possible that this is moulded cladding.

Plate 6: Damaged cladding.



Note: It is also possible that this is moulded cladding. It is badly damaged.

Method of Asbestos Fibre Release

Release of fibres from the base and gaps in Column casings

39. In the forty years since the buildings were constructed the asbestos material has deteriorated. AIB is friable and can be readily damaged so that it releases asbestos fibres, most AIB contains amosite however until 1965 crocidolite was also used. Some AIB contains mainly amosite with a small amount of chrysotile. Some columns are clad in sprayed asbestos containing amosite, which is particularly friable. Amosite is released more readily than chrysotile, HSE estimate at least ten times more readily.²⁶

40. Asbestos materials deteriorate with age, water ingress, vibration from normal everyday use, impact, vandalism, vermin, botched maintenance, installing windows, installing cables and fair wear and tear amongst other means.²⁷ It is also known that when the schools were built it was not uncommon to leave AIB off-cuts and debris in the ceiling or to sweep it into the wall voids and voids in the column cladding.²⁸ HSL state:

"It also seemed that some columns contained a lot of asbestos debris, possibly left inside or even swept up and deposited inside during the initial construction or dislodged from friable coatings due to impacts over the years."²⁹

Plate 7 shows the base of a column where one half of the cladding has been removed. Large amounts of asbestos debris and fibres have accumulated over the years. It should be noted that there is a gap between the base of the metal cladding and the skirting board so that asbestos fibres would have been readily ejected whenever the column was knocked.

41. A report was compiled by Scape³⁰ and HSE Wales following their investigations. It gave details of how the asbestos material had become damaged and described the method of asbestos fibre release. At the same time a Joint Message was issued by HSE, the Local Government Employers (LGE) and DfES, their document contained the same background information and guidance. The Formal Warning Notice and the Joint Message stated:

Further investigations carried out by the Council and the HSE showed that asbestos insulating board fitted during the original construction had been disturbed and fibres been released into the building through gaps in column casings and internal lining to the external wall. The asbestos had been disturbed as the result of a number of events:

²⁶ HSE CAWR Regulatory impact assessment . para A67 p34

²⁷ Department of the Environment Asbestos Materials in Buildings 1983 paras 5.6, 5.7, 5.8 p 18, 19

²⁸ Scape formal Notice Release of asbestos fibres in CLASP buildings 12 Oct 2006 p2

²⁹ HSL Summary of fibre concentrations in CLASP construction schools containing asbestos HSL/2007/22 10 Apr 2007 para 4.2 p14

³⁰ Scape System Build Limited is a Local Authority Controlled Company. It started business in April 2006 and is the trading company for the CLASP Consortium, For more detail consult the Scape web site www.scapebuild.co.uk and the CLASP web site www.clasp.gov.uk.

a. During the construction waste material, including asbestos insulation board and asbestos cement sheet, had been discarded within the external wall cavities and roof space.

b. Works, mainly the fitting of cables had been undertaken post the original construction.

c. Windows had been replaced fixing the new by means which required the disturbance of the column casings and other elements. The window replacement was not carried out using a CLASP/Scape nominated installer.

d. Debris from previous asbestos removal works.

The schools are steel framed buildings, the steelwork being clad with asbestos insulation board (AIB), possibly for fire protection. The AIB itself is encapsulated with metal cladding, which in some cases is fixed to the AIB using screws. In some cases the AIB is fixed to the cladding rather than the steel beams.

There are gaps in the metal cladding of various dimensions. In some cases the cladding is very loose. The AIB contains amosite.

It has been found that if the cladding is struck, asbestos fibre can escape into the room. The degree of escape of fibre varies. In some cases levels in the general atmosphere of the room are very low. But in others levels have been found that exceed the control limit. The striking was three or four sudden blows and is the kind of disturbance that is foreseeable in a school environment.

Disturbance is also foreseeable when doors are slammed where the doors are adjacent to damaged AIB / loose cladding or where possible wind loading on replacement windows which have been fixed by screws directly into the steel columns which are clad with AIB.

The standard of clean up after construction at the schools visited was poor with off cuts of AIB being left in ceiling voids etc. The condition of cladding has deteriorated over the years and sockets and other fixtures have in some cases been screwed through the metal cladding and probably into the AIB.

Window replacement was also carried out to a poor standard with frames screwed into the asbestos. All of these are likely to be 'risk factors'

The mechanism of release is not clear. But in the worst cases it may be associated with the screws moving in the AIB abrading it, the striking of the cladding acting like a 'bellows' to disperse fibre.³¹

42. Plates 4 and 8 show columns in classrooms in a CLASP Mk4 school. Very high amosite fibre levels were sampled when a column and window sill were hit.

43. As has been seen large amounts of asbestos debris can accumulate at the base of a column. The base of the free-standing columns normally have wooden

³¹ Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006 . A joint Message from the HSE/LGE/DfES Asbestos-Potential for exposure in "CLASP" school buildings. October 2006

skirting board around the base, which does not normally act as a hermetically tight seal, at plate 7 it does not even reach the open base of the metal casing so that asbestos fibres will have been readily released.

Plate 7: Base of Column. Large Amount of Friable AIB Debris

Note: One half of the metal casing and AIB cladding has been removed. There is a gap between the bottom of the metal casing and the skirting board. The white fluffy material is amosite debris.



44. Plate 8 shows the bottom of the metal casing, it and the cladding finishes about an inch and a half above the floor. The gap between the column and the cladding is an open void so that any asbestos fibres would not have accumulated over the years, instead they would have dispersed freely into the classroom. The telephone socket has been screwed onto the side of the casing into the cladding. The open screw holes can be clearly seen where the socket has been moved. Anything fastened with screws through the asbestos cladding is liable to cause release of fibres. HSE and HSL state:

"The condition of cladding has deteriorated over the years and sockets and other fixtures have been screwed through the metal cladding and probably into the AIB.

Window replacement was also carried out to a poor standard with frames screwed into asbestos. all of these are likely to be "risk factors."³²

" The presence of holes and screws into the casing involves further levels of damage to the AIB attached in this way and any force or movement applied to the casing is directly transmitted to the AIB."³³

³² A joint message from the HSE/LGE/DfES para 6 Oct 2006

³³ HSL Summary of fibre concentrations in CLASP construction schools containing asbestos HSL/2007/22 10 Apr 2007 para 4.3 p18

Plate 8: Base of Column Casing.

Note: No Skirting. Socket Fastened to Casing. Gap between wall and back of casing. Open screw holes where socket has been removed



Release of fibres from gaps between interior walls and skirting boards

45. The process of fibre release from the gaps in the columns is similar in many aspects to the process of fibre release from the gaps in the AIB or plasterboard interior walls of many System built schools. The fact is highlighted in the Scape Formal Notice:

*During construction it also seems that off cuts of AIB and debris have in some cases been swept into the gap between the wall and plasterboard stud partitioning or wall cladding. Skirting boards then sealed this debris in. When the plasterboard was struck fibre was again released through the skirting board gaps.*³⁴

46. Although most interior walls of System built schools are not asbestos, some are, for it was common to use AIB particularly under the windows as infill panels, as window surrounds and as firewalls in critical locations. At times AIB has been used behind non-asbestos panelling, so it cannot be visually identified. As well as asbestos debris being swept into the wall voids during construction of the schools, fibres are released from the unsealed back of any AIB. For although visible AIB will normally be painted which seals in the fibres, the reverse face will not be painted, therefore each time the wall is knocked, kicked or a child runs into it amosite fibres are released into the void. In addition if the wall is damaged there is the potential for fibres to be released, for it is known that classroom walls have had holes kicked in them.

³⁴ Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006

47. Plate 9 shows a typical AIB window infill panel in a classroom in a System built school, in this case the building is a SCOLA, which in many aspects is very similar to CLASP. The AIB is scuffed which in its own right will release asbestos fibres, however each time that the panel is hit the reverse face releases asbestos fibres in significant quantities. The photograph at Plate 10 was taken by Tyndall beam photography and shows AIB being stacked. The large cloud is mainly amosite fibres which have been created by this simple operation. Knocking the wall will also create a similar cloud in the void, albeit to a lesser degree, it is inevitable that significant numbers of fibres will be released to fall into the bottom of the void to filter through any gaps in the skirting into the rooms.

48. HSE, LGE, DfES and Scape issued guidance in October 2006 which advises that gaps are identified in the column casings, window blind boxes and the internal walls:

"Carry out a visual inspection of following items to ensure that there are no gaps in the elements of the internal lining to the external wall, pay particular attention to column casings and blind boxes..."

Priority for visual inspection to be given to:.... Where internal refurbishment works have disturbed the column casings and the internal lining to the external wall...."³⁵

Plate 9: Interior AIB Window Infill Panel

Note: Some infill panels are a sandwich construction with two layers of AIB. Where the skirting board abuts the floor it is unlikely to provide an effective seal to asbestos fibres in the void. In addition the panel is scuffed .



³⁵ Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings Recommended actions 12 Oct 2006 p2

Plate 10: Cloud of Asbestos Fibres

Note: Tyndall beam photography shows a cloud of mainly amosite fibres from stacking AIB panels. Each time AIB is hit the unsealed reverse face releases asbestos fibres.



Extent of Problem

Numbers of Columns in a School

49. Every System built school has a large number of vertical columns, some are free standing in the centre of rooms or corridors, others stand adjacent to walls or windows. Some columns are concealed as part of the interior wall. It was common to clad the ground floor columns in AIB, although as has been seen in some cases AIB cladding was used on the upper floors as well.
50. Although, in a particular school, gaps in the front of the metal casings were clearly visible, it was impossible to examine the backs of the casings as the columns were within a few millimetres of the window frame or the wall. Every column that was encased had an open top and bottom, the ones near the floor were normally concealed behind wooden skirting board, which inevitably would not prevent the escape of asbestos fibres. Some as has been seen freely vented onto the classroom floor.
51. The tops of the column casings were open and vented into the ceiling voids, as did the base of the casings from the upper floors. When the columns were hit high levels of asbestos fibres were ejected into the void. That was only determined by air sampling, therefore unless air sampling is carried out at the top and bottom of every single column throughout every System built school it will not be known whether asbestos fibres are being ejected or not. Every column would have to be tested under controlled conditions. That is an almost impossible task. Therefore it must be assumed that every column has

the potential to release fibres, consequently the tops and bottoms of all columns have to be sealed under controlled conditions.

52. To give an idea of the extent of the problem, in a small CLASP Mk4b school with twelve classrooms there are 221 columns altogether. When the column casings were checked by a qualified surveyor, all but nine required sealing. It is not known whether the reverse face of the columns needed sealing, or the tops and bottoms of the casings. No air tests were carried out.³⁶ It is known from previous work in the school that AIB debris lies concealed within the wall voids,³⁷ but no mention is made of sealing the skirting boards. The authorities at this school have surpassed the HSE guidance in as much as they had a qualified asbestos surveyor carrying out the checks, for as will be seen HSE consider that the school's maintenance man can carry out the task of inspection and sealing. It would therefore appear that although the school authorities followed the HSE guidance, as no air sampling has been carried out, no one can say whether asbestos fibres will be ejected out of the backs of the casings, out of the tops and bottoms into the voids, or indeed from out from around the skirting boards. No one can say that the silicone sealant has effectively prevented the release of asbestos fibres unless air sampling is carried out following remediation.
53. A later section examines the viability of the HSE Working Group guidance for preventing the release of asbestos fibres. The guidance is flawed as untrained people are permitted to carry out the inspections and sealing. It is inevitable that only the visible gaps in the front of the casings will be sealed. No air tests are required and unless visible debris can be seen by an untrained eye in the ceiling voids, the tops of the columns will not be sealed. No air tests are required once the job is completed and no third party is required to inspect the effectiveness of the work.
54. If the task is carried out correctly so that no asbestos fibres can enter the classrooms, halls and corridors, then it is a mammoth task in each and every System built school throughout the country.

Release of asbestos fibres into the ceiling voids

55. The previous paragraphs have examined the mechanism for the release of asbestos fibres from the cracks in the column casings, from the base of the casings and also from gaps between the classroom walls and the skirting boards. This next section examines the release of asbestos fibres into the ceiling voids.
56. In most System built schools there is a suspended ceiling on each floor. This is by design as the ceiling void is used for running electrical cables, water and heating pipes, gas pipes, computer and whiteboard cabling, in some schools roof heaters and extractor fans were installed in the void. Pipes can be lagged with asbestos and skylights and ducting can be lined with AIB. Intentionally the void was meant to be relatively easy to access so that repairs could be undertaken and new services laid, so over the years there has been frequent disturbance of the ceiling tiles and the void. Extensive use of asbestos was used in critical points in the walls, ceilings and window surrounds in an attempt to slow the spread of fire. However despite this many

³⁶ Derby City Council. Sealing plan. Silverhill Primary school 21 Jun 2007

³⁷ Scientifics Certificate of Reoccupation area 2 class 2114 Apr 2004. Asbestos survey Silverhill school 8 Mar 2005.

System built schools have been totally destroyed by fire. The walls voids open into the ceiling void, as do the column casings. Frequently there are no dividing walls in the void so the whole area is a large open space, this has proved to be fundamental design fault as it allows the rapid unimpeded spread of fire. In later buildings asbestos cloth was used as a firewall, but that in itself causes contamination as the cloth is frequently 100% asbestos. The distance between the ceiling tiles and the roof or the floor of the room above is in the order of two feet.

57. In some schools all the ceiling tiles are AIB and are either screwed in place, or rest on a metal grid. In others the tiles are not AIB although most critical rooms have AIB tiles, such as kitchens, cookery classrooms and lavatories. Frequently there is a strip of AIB running along the top of each window at the edge of the ceiling. The unsealed AIB cladding from the columns and the walls can protrude into the void. The visible under-surface of the AIB tiles will be painted which will seal in the fibres, however the top surface will not be sealed, so that fibres can be released. Any asbestos contamination in the ceiling void can filter through the smallest gap, therefore to prevent this the ceiling has to be hermetically sealed, and any entry to the void or lifting of a tile has to be under strictly controlled conditions or the person carrying out the task will be contaminated, as will the room beneath.
58. Plate 11 shows ceiling tiles in a metal grid in the suspended ceiling of a classroom. The tile is broken and a draught of air could be felt coming down through the hole, any asbestos fibres would have filtered down into the classroom. What should also be noted is that the adjacent tile is ill-fitting, so that if any asbestos fibres were on top of the tiles they would filter between the tile and the grid. In the same school many tiles had far larger gaps between the tile and the grid, some tiles were missing, others non-asbestos tiles were badly broken or sagging under the weight of water damage. As well as damaging the more friable asbestos materials a leak will allow the asbestos fibres to be suspended in the water to drip into the room beneath. When it finally dries out the fine asbestos fibres are left so that they can become suspended when disturbed.
59. See plate 12 for an example of badly damaged tiles in a corridor. Air sampling had proved that there is asbestos contamination in the ceiling void. This photograph was taken after remediation and after the contractor had declared the school safe for re-occupation. HSE had also carried out an inspection and agreed that remediation was complete and the school safe for re-occupation.³⁸ They are wrong, for as well as allowing asbestos fibres to enter the corridor, the fire integrity of the ceiling is lost. In some classrooms tiles had been lifted to suspend Christmas decorations from the metal grid. All these processes would allow the ingress into the classrooms of any asbestos fibres resting on the top surface of the tiles, whether they were AIB tiles or not.
60. HSE, LGE, DfES and Scape guidance given in October 2006 stresses the need to examine where refurbishment works might have disturbed the column casings and walls, it also stresses the need to identify gaps between ceiling tiles and their grid:

"Priority for visual inspection to be given to:

³⁸ Letter HSE London Division Buonnoo 30 Jan 2008

....where ceiling tiles have been accessed and tiles not replaced correctly...

*If gaps are found they need to be sealed with a silicone sealant.*³⁹

61. Plate13 shows the column as it passes through the ceiling void. The ceiling tiles have been removed so that the top of the column could be sealed. At the bottom of the photograph the white column casing can be seen, it finishes as it enters the ceiling void where the air gap between the cladding and the column vents freely into the void. Presumably when the school was built the two wooden wedges were banged down in the gap between the column and the AIB cladding to hold it in place. The top of the cladding opens freely into the void. When the casing was hit high levels of amosite fibres were ejected out of the top of the casing into the ceiling void. This was under controlled conditions, however they would normally have settled onto the top surface of the tiles, to filter down through any gaps. Either that or they would have precipitated into the adjacent open wall voids.

62. What is significant is that there were classrooms on the floor above. In this case the column was clad in AIB on the first floor as well as the ground floor with the open base of the cladding and metal casing protruding into the top of the ceiling void. Therefore every time that the column was knocked on the first floor asbestos fibres would have filtered down into the ceiling void.

63. In addition to any fibres being ejected from the column casings and walls, it has been found in some schools that AIB debris has been left in the ceiling voids from when the schools were built. In October 2006 following the inspection of a number of System built schools HSE, DfES, LGE and Scape stated:

*"The standard of clean up after construction at the schools visited was poor with off cuts of AIB being left in ceiling voids etc..."*⁴⁰

*During construction it also seems that off cuts of AIB and debris have in some cases been swept into the gap between the wall and plasterboard stud partitioning or wall cladding. Skirting boards then sealed this debris in."*⁴¹

*During the construction waste material, including asbestos insulating board and asbestos cement sheet have been discarded within the external wall cavities and roof space."*⁴²

³⁹ Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings Recommended actions 12 Oct 2006 p2

⁴⁰ A joint message from the HSE/LGE/DfES Asbestos potential for exposure in "clasp" school buildings. October 2006 Potential for asbestos fibre release in CLASP buildings para 6. Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006

⁴¹ A joint message from the HSE/LGE/DfES Asbestos potential for exposure in "clasp" school buildings. October 2006 Potential for asbestos fibre release in CLASP buildings para 8 Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006 para 8

⁴² Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006 p2

In July 2007 after even more schools had been inspected the HSE CLASP Working Group warned that it was not unusual for asbestos debris to be in the ceiling voids. The minutes stated:

"Caution is necessary for assessing the results of maintenance above ceilings, as it is not unusual for asbestos debris to be left in areas around the tops of columns.

*Situations and amounts of asbestos debris may vary and precautions- such as wearing PPE- should be taken."*⁴³

64. It is inexcusable that AIB off cuts and debris are only now being found in the ceiling voids of schools. When one considers that they were left there when the schools were constructed some forty years ago and have remained there ever since, undiscovered. For guidance to look in the voids has been in existence since at least 1983 when the Department of the Environment guidance warned that:

*"It should be borne in mind that asbestos materials might be concealed, for example in heater units, inside ducting or behind false ceilings."*⁴⁴

The message has been periodically re-iterated in the Department of the Environment Guidance in 1986, 1991 and in the latest (2001) HSE guidance on surveying mentions that voids should be inspected. HSE MDHS 100 states in relation to type 1 and 2 surveys:

*"All areas should be assessed and inspected as far as reasonably practical (e.g above false ceilings and inside risers, service ducts, lift shafts etc"*⁴⁵

This failure to identify the asbestos off-cuts and debris in the ceiling voids was highlighted in 2007 by HSL in their 2nd report. They stated:

"Asbestos management

A type 1 or 2 survey as described in MDHS 100, requires that the ceiling void of suspended ceilings are accessed to check for ACMs and asbestos debris.

Therefore if a building survey has been carried out in accordance with HSE guidance the presence of asbestos debris from the installation or subsequent alterations should have been detected and located.

*If for some reason the surveyor did not access the suspended ceiling, as they should have done, the area should still have been marked as presumed to contain asbestos and work in the ceiling void should be subject to the restriction and controls in CAR, 2006, unless further assessment has been carried out by a competent person."*⁴⁶

⁴³ HSE Asbestos in schools CLASP Working Group minutes 16 Jul 2007

⁴⁴ Department of the Environment Asbestos materials in buildings 1983 para 5.5

⁴⁵ HSE MDHS 100 paras 13, 14 Jul 2001.

⁴⁶ HSL. Further measurement of fibre concentrations in CLASP construction buildings. Tests at the original school where problems were found. Dated Sep 2007. Circulated Jan 2008. Para 3.5 p 26

Plate 11: AIB Ceiling Tiles in a Classroom

Note: Broken AIB. Asbestos fibres will be also filter from around the ill-fitting ceiling tile. A draught could be felt from the hole, asbestos fibres would have entered the classroom.



Plate 12: Badly damaged ceiling tile in school corridor

Note: This is a CLASP Mk4 school. It is known that the ceiling voids are contaminated with asbestos. Although these tiles were not AIB, any fibres in the void would readily enter the corridor. In addition some of the other tiles are not firmly seated on the grid. Note this photograph was taken after remediation. The contractors and HSE declared the school safe for reoccupation.



Plate 13: Column Casing and Cladding Open at Ceiling Void

Note: CLASP Mk4. The ceiling tiles have been removed for access. The top of the white column cladding just protrudes into the ceiling void. The wooden wedges hold the AIB cladding in place. The air gap between the column and the AIB cladding vents freely into the void at the top of the photograph and the bottom.



Recommendations for System built schools

65. This guidance specifically addresses the problem of asbestos fibre release from walls, column cladding and ceiling voids in System built schools. It is not designed to be definitive guidance for the general management of asbestos in schools.
66. This guidance is based on best practice and has been written in consultation with experienced asbestos consultants. This paper gives proof that there are flaws in the HSE CLASP Working Group guidance that could allow release of asbestos fibres, exposure of the operatives, contamination of classrooms, and consequential exposure of the occupants of the schools. Therefore where appropriate the Working Group guidance has been strengthened. It is recommended that the following actions are taken before the school can be considered safe for occupation.
67. It is suggested that the school's Asbestos Management Plan should be amended to take account of the recommendations of this document. It should also include the results of all air sampling, any remedial work carried out and any inspection or survey undertaken. In addition all future inspections carried out to check on the condition of any remediation should be recorded. All the actions, precautions and safe systems of work need to be recorded in the Asbestos Management Plan.

Summary

68. Many System built schools contain large amounts of asbestos in their structure in critical areas to protect structural components from fire and to prevent the spread of fire. Kitchens and domestic science/cookery rooms often have AIB tiles. AIB was also used in areas subject to high humidity such as toilets. Although some of the asbestos material is visible, much of it is hidden in walls, ceiling voids and as column cladding behind metal casings. Over the years some of the asbestos material has deteriorated and released asbestos fibres into the voids, in some schools asbestos debris and off-cuts were left in the ceiling voids or swept into the wall and column voids when the schools were built.
69. In some System built schools significant numbers of asbestos fibres are released into the rooms, the ceiling, wall and column voids when interior walls and cladding on structural columns are hit or disturbed. Those levels can be above the Control Limit. Fibres are also released when doors and windows are slammed and window-sills are shaken or a person sits on them. Where window frames have been fastened to column casings a strong wind can release asbestos fibres as the windows flex. Any fitting or fixtures screwed onto the casings are also liable to release asbestos fibres into the rooms or voids. Any disturbance is liable to eject the asbestos fibres through the smallest gap, crack or hole in the walls or columns. The fibres are also ejected out of the open base and top of the column cladding. Any asbestos fibres in the ceiling void will filter down through the smallest of cracks into the room beneath. Asbestos fibres will migrate with similar properties of a gas, if air can get through a gap then so can the asbestos.

Training and Qualifications

70. This guidance specifically advises when it is considered that a specialist licensed asbestos contractor should carry out a task. However there are occasions that a non-specialist can carry out certain task that will not involve the disturbance of asbestos materials. School managers, maintenance staff and caretakers should be trained so that they understand the risks from asbestos. They should have a good working knowledge of the school's asbestos management plan, survey and asbestos register and they should be aware of the whereabouts of known and possible locations of asbestos in their school. They should be fully conversant with the available guidance on how to carry out tasks on asbestos materials, and be aware of the simple tasks that they might be able to perform and those that require specialist contractors. They should be trained so that know which measures they have to take to prevent damaging or disturbing asbestos materials.
71. It should be stressed that the majority of school maintenance staff and caretakers will not have had sufficient training that would allow them to safely enter an asbestos contaminated area or carry out any task that may disturb asbestos fibres. Therefore they should not attempt to carry out any task that may disturb asbestos materials.
72. HSE Asbestos Essentials is on the whole a well written guide and it stresses the importance of training and carrying out even the most minor tasks under carefully controlled conditions. EM2 of the guidance gives details of the training requirements. For instance the changing of the bulb in a light fitting attached to an AIB ceiling tile requires the person carrying out the task to be properly trained, as does the simple act of lifting the edge of a contaminated, or AIB, ceiling tile. The person who intends to change the bulb or lift the tile, has to wear a disposable overall (Type 5) with a fitted hood, boots without laces and a disposable particulate respirator (FF P3). The surrounding area should be covered with polythene sheeting, warning notices should be displayed and entry to the room restricted. The outside and inside of the light fitting has to be cleaned in a specific manner that restricts the release of asbestos fibres, and that has to be done before even attempting to remove the bulb. The cleaning should be done with a specialist vacuum that prevents the escape of asbestos fibres (HEPA vacuum) and then further cleaning has to be carried out with wet rags, which should be disposed of as hazardous waste.

It is highly unlikely that a school will have access to such a vacuum or the protective equipment. A normal vacuum will cause more harm than good as it will blow asbestos fibres around the room. Once the bulb has been changed then the person who carried out the task has to decontaminate using specialist procedures. All equipment and surfaces that might have been contaminated have to be thoroughly cleaned and any rags, polythene sheeting, masks and overalls disposed of as hazardous waste.

Therefore if the school's maintenance staff or caretaker do not have the training and equipment, specialist contractors should always carry out the task, however simple it may appear.

See: <http://www.hse.gov.uk/asbestos/essentials/index.htm>

Asbestos survey

73. The Asbestos Register should include details of the type of building, (Eg: CLASP, SCOLA, Hills etc) the Mk, date built and details of specified locations of asbestos and possible locations of asbestos. These details can be determined in a desk top survey. Following the desk top survey a thorough Type 2 asbestos survey should have been carried out in the school by a UKAS accredited surveyor. The surveyor should also be experienced. A newly qualified surveyor might legally be able to carry out the survey but it is unlikely that he or she will have acquired the necessary skills or experience.
74. The survey should take place when the school is not occupied, and bulk sampling of materials should be taken so that the asbestos content can be determined. All the results and material and personal risk assessments should be recorded in the schools asbestos register. Recommendations should be given on how to manage any known or suspected asbestos. In some surveys the system of asbestos management is couched in vague, general terms that to most non-expert readers it will be almost meaningless. The recommendations and actions to be taken to manage specific items of asbestos materials should be clear and practical.
75. An additional visual survey/inspection should be carried out to identify and record the specific problems with System buildings. This survey should identify any columns with loose cladding, gaps in cladding, fitting and fixtures fastened to cladding and any gaps behind the columns or where they enter the ceiling void. It should identify gaps in skirting board around columns and along walls. Any gaps or holes in walls should be identified.
76. The ceiling void should be a sealed space, for if it is not then asbestos fibres can enter the rooms. Any missing, damaged and ill fitting ceiling tiles should be identified. All the ceiling tiles should fit snugly in the ceiling grid with no visible gaps. The joint between the tile and the grid should be sealed with paint or sealant, if it is not the fact should be noted. Although HSE guidance allows this inspection to be carried out by the school's maintenance staff, it is advisable to use a licensed specialist surveyor.
77. The ceiling void should be inspected wherever possible. However entry to the void must only be carried out under carefully controlled conditions as detailed in the HSE Asbestos Essentials. If there is possible asbestos contamination in the void all ceiling tiles have to be treated as if they have asbestos contamination on the top surface. It is strongly advised that any procedure that involves disturbing the ceiling tiles, whether they are Asbestos Insulating Board (AIB) or not, is carried out by a specialist licensed contractor or UKAS accredited surveyor. Further advice is given below.
78. All the findings should be entered on the asbestos register.

Air sampling

79. It is likely that the school's asbestos survey will only identify the visible and accessible asbestos materials. Any areas that are difficult to access are invariably listed as "Assume asbestos present." This assumption might alert any workmen about to undertake work in the area, but it does not identify whether the asbestos is present or whether it is in a damaged condition and releasing asbestos fibres. The hidden materials can be identified by removing the cladding,

wall or ceiling tiles and carrying out an inspection, however in most cases this is not advisable as it could potentially release high levels of fibres. HSL advised sending small cameras or endoscopes into the column voids to identify any damage or debris. However that is only practical on a limited scale. In addition such a system still does not address whether normal day-to-day occupation would disturb the asbestos material sufficiently to cause asbestos fibres to be released.

80. Air sampling in the rooms and ceiling void is a practical alternative for if carried out correctly, it will readily identify if asbestos fibres are being released into the rooms and ceiling void. This is a particular problem that was identified with System built schools where hidden damaged asbestos was releasing significant levels of asbestos fibres into the rooms, and conventional type 2 asbestos surveys had failed to identify the problem. The release of asbestos fibres was only identified when air sampling was carried out.
81. It is therefore advised that air monitoring should be carried out to establish airborne asbestos fibre levels in schools. It is important that these tests are carried out with disturbance representative of typical day to day activity in the school. It is inevitable that there will be non-asbestos fibres in the school such as carpet fibres and dust which will be disturbed and may obscure the filters. When this occurs more than one sampler should be used with shorter periods of sampling to reduce the dust loading on the filters, as per the guidance in the HSE Analysts' Guide to Sampling. Where there is a significant proportion of countable fibres in the air samples which appear not to be asbestos, Scanning Electron Microscopy, Transmission Electron Microscope (TEM) or Plasma Arc Etching (Ashing) analysis can also be used to distinguish asbestos fibres, and thus the true asbestos concentration can be determined.
82. When there is no disturbance, asbestos fibres will settle on surfaces and will not become airborne. Consequently air sampling conducted with no disturbance of surfaces will inevitably record low fibre levels. They will be significantly lower than when the school is occupied with staff and pupils, consequently the results of test carried out without disturbance when the school is empty cannot be considered as representative. Proof of this was provided in a CLASP building when air sampling gave levels above the Control Limit when disturbance was carried out by banging a column, and yet the levels were beneath the Clearance Level when disturbance had not taken place.⁴⁷
83. If the school is not occupied "Reassurance" testing without disturbance cannot be used as valid method for assessing fibre levels after an asbestos incident, neither can it be used to justify the area being reopened for normal use. Analysts frequently use Reassurance testing without disturbance following a release of asbestos fibres to give reassurance that the classrooms are safe to reoccupy. Regrettably on too many occasions these are unjustifiable and invalid assurances.
84. If air sampling is carried out while the school is normally occupied then the results will be a true representative measure of airborne fibre levels for the period of sampling, so long as care has been taken in the siting of the samplers. But the problem is that if no one happens to slam a door or hit a wall on the day sampling

⁴⁷ A Joint Message from the HSE/LGE/DfES Asbestos - Potential for exposure in "clasp" school buildings para 5. Oct 2006. Scape formal Notice Release of asbestos fibres in CLASP buildings Potential for asbestos fibre release in CLASP buildings 12 Oct 2006

is taking place, then these potentially high peak levels will be missed. It is therefore essential to also carry out sampling outside school hours. In most cases sampling only takes place when the school is unoccupied consequently the asbestos will not be disturbed, therefore disturbance should take place that simulates normal activities including vigorous brushing and dusting of surfaces, as would normally happen when the school is cleaned. More vigorous disturbance testing should be undertaken such as slamming doors or hitting walls and columns to assess the peak levels. However this should only be carried out under controlled conditions in a sealed enclosure, as high fibre levels can be released it should not be attempted outside an enclosure. If this intentional disturbance does not take place then it will not be known whether damaged deteriorating asbestos and debris is hidden in the voids with the potential to release its fibres.

85. Disturbance should replicate the normal activities that take place when the school is occupied by staff and children. The type of disturbance that has been carried out should be recorded on the air test results, along with how it was created and for how long and how often it took place. Only then can the air tests be considered as a valid reassurance that the classrooms are safe to reoccupy.
86. Where necessary environmental cleaning should be carried out by specialist licensed contractors.
87. If raised fibre levels are counted then the source of fibre release should be determined and remedial measures carried out until the counts are reduced to an acceptable level. It has to be stressed that although rooms can be legally occupied at the Clearance Level it is not an acceptable permanent background level and is unsafe particularly for children. It is only acceptable as a transient level.
88. The results of air sampling should be recorded in the Asbestos Register. They should also be compared with the Risk Assessments in the asbestos survey, and the assessment should be amended depending on the results.

Asbestos fibres released from gaps in column casings and walls

89. Having identified all the gaps, cracks and holes in the column casings they should be sealed initially below the ceiling level. Attention must equally be paid to sealing the backs of the casings where the column is free standing in a room. Particular care should be taken to ensure that a complete seal is obtained, for it can be difficult to access the backs of the casings as they can be only a few millimetres from the adjacent wall or window frame. Where the gap is too great for silicone sealant then expanding foam could be used to fill the gap, however the effectiveness of the seal should be regularly checked as the flexing of any adjacent window frame could unseat the sealant. The frequencies of these re-inspections should be set out in the asbestos management plan, and will depend on the location, vulnerability and type of sealing that has taken place. It is suggested that in critical areas where it is likely that the seal could be broken then the inspections should be weekly, whereas in less critical areas then a monthly inspection should be sufficient.
90. A good quality silicone-based sealant should be used. Where possible uPVC strips can be used over the top of the sealed gaps in the columns gluing them in

place with the same sealant. Particular attention should be paid around the base, where the casing interfaces with the floor or skirting. In addition all other edges, cracks, gaps and holes should be similarly sealed, such as where the casing abuts the wall, the window panel or the window frame.

91. In some schools HSE has identified similar problems of fibres being ejected from beneath interior walls when the walls were hit. This is because asbestos debris was swept into the voids when the schools were built, also asbestos materials in the wall voids have deteriorated over the years and have released fibres. In the test cases the walls were plasterboard, and therefore it must be assumed that the problem of asbestos fibre release would be more prevalent with AIB walls. All gaps, cracks and holes in walls must be sealed. Particular attention should be paid to sealing the skirting board to the wall and the skirting board to the floor. It is likely that an effective seal will be difficult to achieve. Sealant will not adequately adhere to floor polish or rough surfaces, therefore the surface should be cleaned and if necessary sanded before applying the sealant - specialist help may be required for this.
92. The CLASP Working Group advise that if the column casings are loose then they should be re-secured by checking the fixings in the ceiling void and behind the skirting. They allow the school's maintenance staff to carry out the inspection and refastening. This is bad advice. If the casing is loose it is probable that asbestos fibres will have accumulated at the base of the column and also contamination will be present in the ceiling void. Therefore any such work should only be carried out by a specialist licensed contractor under controlled conditions in a sealed enclosure. Before any inspection or work is considered in the ceiling void the guidance in the next section should be read and followed.
93. An assessment should be made whether any fittings and fixings attached to the casings could by their nature or use, disturb the AIB cladding and release asbestos fibres. Pulling out an electrical plug from its socket for instance could possibly flex the column casing. A door latch fixed onto a column casing will inevitably disturb the AIB when the door is closed. If it is decided to remove the fitting or fixings this should be carried out under carefully controlled conditions, which are laid out for similar tasks in the HSE Asbestos Essentials Task manual.
94. It should be ensured that safe working practice is employed when removing existing screws from the casing. This applies to the removal of electrical sockets, computer terminals, associated ducting and any other fittings and fastenings. The resulting holes should be immediately sealed.
95. The screws, and where contamination is possible the fittings, should be disposed of as hazardous waste. The local authority will give instructions on disposal of such waste. If more than a few fittings are to be removed then this should be carried out by a licensed contractor.
96. Doors, windows and concertina expanding partitions might be fastened to column casing that contains AIB. It is probable that unless the asbestos is in good condition, then the continued opening and closing of the door, or partition over the years will release fibres. It is known that window frames screwed onto columns containing AIB have released asbestos fibres through the flexing of the window in a strong wind. The only way to determine whether asbestos fibres are being released is to carry out air sampling while opening and closing the door window or partition. This should be carried out under controlled conditions. If there are raised levels of asbestos fibres then it indicates that the asbestos is

damaged. If this is the case then expert advice should be sought on how they can be safely hung and operated in future. Doors should not be removed without expert advice as they will normally act as a fire-break.

97. It was common in System buildings that the window surrounds were AIB. In some schools the window blinds or curtain rails have been fixed to AIB. If they have, the fixings should be removed under controlled conditions and the holes sealed. All window surrounds should be checked whether they are AIB and any fastenings removed under controlled conditions.
98. A good quality silicone sealant should be used. In some cases it is unlikely that the sealant will provide a complete seal for more than a number of months, although where the surfaces are suitable the seal could last for a number of years. Children are curious and therefore strips of sealant could be removed or partially removed by inquisitive fingers. Therefore a programme for routine inspection of all the casings, walls and ceilings including the condition and fidelity of the seals, should be introduced. This should take place at least once a month, or in cases of vulnerable locations at least once a week. If it is decided that weekly inspections are necessary then that would tend to indicate that a more permanent method of sealing is required that is more resistant to damage or disturbance.
99. The HSE CLASP Working Group allow the inspection and sealing to be carried out by the school's maintenance men. It is however recommended that the inspection and remedial work is carried out by a specialist contractor. Raised fibre levels were counted during the process of sealing the columns, therefore if more than a few cracks are to be sealed an unacceptable level of exposure could occur.
100. Where remediation has already taken place this should be inspected to ensure that it has been carried out to a satisfactory standard. If not, any sealant should be removed and replaced under controlled conditions, the sealant should be treated and disposed of as hazardous waste.
101. HSE, HSL, Department of Education, Local Government Employers and Scape guidance all advised that once the remediation work had been finished air sampling should be carried out to confirm the success or otherwise of the work. Indeed in some cases it was only air sampling that proved asbestos fibres were still being released following remediation. Despite this the HSE CLASP Working Group guidance no longer includes this advice, and instead permits a visual inspection to ensure that the sealing is effective. A visual inspection is certainly required and ideally by someone other than the person who carried out the work. However in addition it is strongly recommended that that air sampling is carried out otherwise it is impossible to say whether fibres are still being released. These test should be carried out with disturbance under controlled conditions to ensure that the seals will act as an effective barrier when the room is normally occupied.
102. A system of management should be implemented and recorded in the Asbestos Management Plan to:
 - Prevent any more holes being drilled in any of the column casings.
 - Make a record in the asbestos management plan of the frequency of inspections that will have to be carried out to check that the seals remain intact. Each inspection should be recorded in the asbestos management plan.

- Carry out a risk assessment of any future activity or work which involve disturbance or impact upon the casing and assess the potential for disturbance of ACMs and fibre release.
- The Asbestos Management Plan should be amended to take account of any findings.

Release of asbestos fibres into ceiling void

103. The following applies whether the ceiling tiles are AIB or not.

The void

104. Any asbestos fibres in the ceiling void can readily enter the rooms. It is therefore necessary to eliminate the source of contamination by removing any accessible AIB off-cuts, debris and dust, sealing the column casings and open wall voids and environmentally cleaning the void. Regardless how thorough the sealing and cleaning might be any asbestos fibres in the void can readily enter the rooms through the smallest crack or gap, just as easily as air can. Therefore once work has finished in the void the ceiling tiles should fit precisely in the ceiling grid and any cracks or gaps should be sealed from beneath with a suitable paint or sealant. As recommended by HSE and Scape.
105. Contamination of the ceiling void can occur when the columns are disturbed by being kicked, hit or squeezed. Asbestos fibres are ejected from the gaps in the side and base of the casings and also the tops into the ceiling void. Contamination can also occur if the column casings from the upper floors contain AIB and extend downwards into the ceiling void beneath.
106. HSE also identified that the same process can occur when a wall is knocked or hit, asbestos fibres can be ejected out of the top of the wall void into the ceiling void. A further source of contamination has been identified in some schools where asbestos debris and AIB off cuts were left in the voids when the schools were built. In addition some schools contain asbestos firebreaks or pipe lagging in the ceiling void.
107. If an inspection of the ceiling void has not taken place during the asbestos survey, the survey will probably "assume" the presence of asbestos materials in the void. As the condition of the void or the presence of contamination has not been assessed, it has to be assumed that asbestos materials, debris and fibres are present and that the ceiling void is contaminated.
108. The ceiling voids should therefore be considered to be asbestos-contaminated throughout, and controlled safe working procedures should take place with controlled access only. Any person accessing the areas should have a risk assessment carried out before the activity takes place, they should be authorised, properly trained and wear the correct specialist disposal overalls and specialist masks [Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE)].
109. In a school this will normally entail any inspection or work being undertaken by specialist licensed contractors, although it is within the law for a non-specialist to inspect and carry out limited work on asbestos materials. Contamination of the

rooms is likely unless rigorous controls are in place, it is also probable that the person carrying out the task will become contaminated. It is therefore strongly advised that any removal of ceiling tiles, or any inspection or work in the ceiling void is carried out by a specialist licensed contractor.

110. The point of access needs to be segregated in the form of an airlock to contain any possible debris or asbestos fibres which may be released when the ceiling tile is lifted, dropped or slid to one side. If emergency access has to be made without preparation of the airlock, the area below the point of access should be isolated, sealed and all other personnel excluded. This should then be subject to an environmental clean and reassurance air monitoring.
111. Despite the rigorous controls that are necessary, and recommended by HSE, to even look inside the ceiling void, the CLASP Working Group guidance allows a visual inspection of the void by the school's maintenance staff to determine if there is any asbestos contamination. This is not considered to be good advice, for as has been seen this paper recommends that the inspection is carried out by specialist contractors. For if the lifting of one tile can cause contamination then the chances are greatly increased when many tiles are lifted during the inspection of the whole area of the void.
112. The Working Group guidance is also flawed because a visual survey will only be able to identify obvious AIB off-cuts or bits of debris lying around in the void. A visual inspection by non specialist maintenance staff is not going to identify asbestos dust and fine fibres that may be lying on girders, struts, cables, pipes, lagging and any other surfaces. Only specialist air and dust sampling will achieve that.
113. Any work on or around asbestos materials must be carried out as safely as possible. These safe working practices should be based on the findings of a desk-top survey, the asbestos survey and the results of the air sampling, they should be recorded in the asbestos register. This has particular significance when work is carried out in the ceiling void where asbestos contamination is probable, and even the lifting of a ceiling tile can allow asbestos contamination of the room beneath.
114. It is highly unlikely that the school's maintenance staff would wear a personal air sampler, whereas a specialist contractor will. The maintenance staff will therefore have no idea if asbestos fibres are present or whether the control limits are likely to be exceeded. The sampler measures the exposure of the operator, therefore the time spent in the void should be recorded bearing in mind the control limit of 0.1 f/ml of airborne fibres averaged over a 4-hour period. If this control limit is likely to be exceeded, then the exemptions to the Control of Asbestos Regulations 2006 in Regulation 3(2) no longer apply. By law the proposed work would then have to be performed by a licensed contractor.
115. If significant asbestos fibre levels are present in the void then the area will have to be environmentally cleaned by a licensed asbestos contractor prior to the work.
116. Licensed asbestos contractors should be used to inspect and seal the tops of the column casings with expanding polyurethane foam or a similar material. The tops and base of columns on the first floor that extend into the ceiling voids must be similarly sealed if they contain AIB. The foam should comply with the appropriate fire certification.

117. HSE identified that asbestos fibres can also be released from the tops of the wall voids when they are open to the ceiling void and recommended that these are also sealed with expanded foam. Unless there is definitive proof that the voids do not contain deteriorating asbestos materials, AIB off cuts, asbestos debris or fibres, then these should also be sealed.
118. Any benefits from sealing the tops of the casing and walls in the ceiling void are probably negated by the amount of disturbance in the short term caused by removing the tiles to enable sufficient access to seal the casing tops and wall void. Unless the ceiling void is environmentally cleaned immediately after the sealing has been carried out, then the ceiling void will remain contaminated.
119. If on inspection it is found that there are only a few bulkheads to divide the ceiling voids into manageable smaller areas, it might not be practicable to clean the whole ceiling void in one operation. If that is the case an option would be to divide the area with polythene sheeting and then environmentally clean each area.
120. Once work has been completed in the ceiling void, the void should be systematically sealed. If no work is planned, or it is unlikely to take place in the immediate future, then the following action should be undertaken as soon as possible:

The ceiling tiles

121. If there are damaged, ill-fitting or missing ceiling tiles then any hole or gap will permit asbestos fibres to enter the rooms. It must therefore be assumed that the rooms have additionally been contaminated from this source.
122. The integrity of the ceiling void must be secured. The following are recommended actions:
- If disturbance of ceiling tiles or entry into the ceiling void is necessary then proceed as above.
 - Replace missing or badly damaged ceiling tiles. Repair minor damage. Treat all tiles as contaminated with asbestos fibres. Repair or replace AIB tiles with minor damage as per the HSE Asbestos Essentials.
 - If it is not known whether the tile is AIB then it should be treated as if it is AIB.
 - Any disturbance of the walls, columns and ceiling void must be carried out under controlled conditions, as above.
 - For all other work from within the rooms:
 - The guidance in HSE Asbestos Essentials should be followed.
 - Ensure that all tiles fit precisely in the ceiling grid.
 - Seal the gap between the column casing and the adjacent ceiling tile. It is possible that AIB tiles have been used along the edge of the ceiling where it joins the walls and windows. This is possible even when most of the ceiling tiles in a

room are not AIB. This should be borne in mind when carrying out any work and any sealing or painting should be carried out in accordance with HSE Asbestos Essentials.

- Seal all gaps by either painting with suitable paint or by applying suitable sealant to all the edges of the ceiling tiles where they rest in the grid.
- If the tiles are nailed or screwed to a concealed grid the integrity of the void is more likely. However it must be assured that the joins are painted or sealed, that no screws are missing and that no cracks or gaps are visible. If tiles are screwed or nailed to the grid it is likely that they are AIB. In which case the painting and sealing should be carried out in accordance to HSE Asbestos Essentials.
- As has been seen ceiling tiles should only be lifted or disturbed under controlled conditions. On no account should children's work or decorations be hung from tiles or the ceiling grid.
- Routine air monitoring should take place once the work is finished with disturbance that simulates normal occupancy and activity.

Fire integrity

123. Asbestos was used in buildings to protect critical parts of the structure from fire damage and to prevent the spread of fire. If previous asbestos remedial works have removed ceiling tiles and replaced them with unsuitable materials then the fire integrity of the school is likely to have been breached. It is also breached if there are missing ceiling tiles or damaged or ill fitting tiles. In one school where tests were undertaken wooden joists and floorboards were unprotected where AIB ceiling tiles had been removed and not replaced. If walls have had holes drilled in them to allow cables and pipes to pass through, then all of these have probably breached the fire integrity of the building, all of these will allow the spread of fire. All ceiling tiles should be replaced with materials of a suitable fire resistance, all damaged tiles should be repaired or replaced. All ill fitting tiles should be refitted so that they sit precisely in the ceiling grid and the join should then be sealed with suitable paint or suitable sealant. Where asbestos materials are removed they must be replaced with materials of a similar or improved fire resistance.

Asbestos exposure is cumulative

124. It is known that asbestos fibres are released in some System built schools when the walls and column casing are hit, when the window sills are disturbed and when doors and windows are slammed. It is probable that in a number of schools the occupants have been exposed to unacceptable levels of airborne asbestos fibres over a prolonged period. As mesothelioma can be caused by low level cumulative exposures to asbestos fibres, rigorous measures must be taken to eliminate the future exposures of the occupants of the school.

Conclusion

125. In 1987 it was found that slamming a door five times ejected high levels of asbestos fibres into the classrooms of a System built school. Twenty years later

in July 2006 the identical problem was identified in a school in Wales. It was only then that other schools were advised to check whether they had a similar problem and guidance was given to seal all the gaps so that the damaged asbestos would not be released. Despite local authorities being told to treat the matter as a priority, in December 2007 an independent test carried out as part of an ITN investigation discovered that Brent Council had done nothing to protect the occupants of a special school. The levels of asbestos fibres released into the classroom were such that by law the occupants should have been wearing breathing apparatus and protective clothing.

126. But this school is not unique for there are thousands of schools throughout the country in a similar position where at the very best only a strip of silicone sealant keeps the occupants safe from the damaged asbestos debris and off-cuts lying in the columns, walls and above the suspended ceilings.
127. People must ask the Government quite how they allowed our schools to deteriorate to such a state that teachers, other staff and children are daily exposed to asbestos fibres whenever a door is slammed or a child runs into a wall. They must ask why after the problem was identified, nothing was done for twenty years to prevent the release of asbestos fibres in thousands of other schools of a similar design.
128. When the problem was rediscovered HSE advised schools to seal all the gaps and cracks with sealant to seal in the damaged asbestos, debris and fibres. However although that can reduce the release of fibres it cannot be guaranteed to work and at the very best can only be considered as a very temporary measure. The extent of the problem is profound and has to be faced by the Government. No longer can they pretend that there is not a problem or it is one that will go away. Each day the asbestos deteriorates so rigorous measures must be taken to manage it, but even the best systems of management can and have broken down, consequently the only medium to long term solution is removing all of the asbestos completely or building new schools.
129. The second part of this paper looks at the 1987 ILEA reports and examines the levels of asbestos fibre release in System built schools. It then critically examines the two HSL reports written following the 2006 rediscovery of asbestos fibre release in similar schools. It summarises the levels of airborne asbestos fibres, it questions the selection of buildings for the tests, and the viability of results and conclusions. It gives details of fibre levels determined in independent tests carried out by ITN in a System built school. It puts asbestos fibre levels into perspective with examples of the number of asbestos fibres inhaled by a child in a classroom.
130. The paper critically examines the CLASP Working Group guidance issued in March 2007 and gives evidence why the guidance is seriously flawed.

Michael Lees
12th June 2008

ANNEX 1. PART 1. TIMETABLE OF EVENTS

131. Twenty years ago in November 1987 the Inner London Education Authority (ILEA) conducted air sampling in a System built school in Wandsworth and found high levels of asbestos fibres were released when the door was slammed five times. The level was 0.33f/ml. The report states:

"Slamming a door five times resulted in measurements averaging 330 fibres per litre of air: that is 33 times higher than the safety limit set by the Health and Safety Executive."⁴⁸

132. In the intervening twenty years the lessons were not heeded, they were forgotten. However the release of asbestos fibres continued at dangerous levels in schools throughout the country from everyday occurrences.

133. In November 2004, following a number of serious asbestos incidents in schools and the increasing deaths amongst teachers from mesothelioma, an "Asbestos in schools stakeholder group" was established by HSE and DfES to;

"improve the asbestos management in schools".

HSE's stated aim was to :

"dramatically reduce asbestos exposures."⁴⁹

This group was to investigate the overall scale of the asbestos problem in schools, and had executive powers to implement their decisions. However, despite protests from DfES, the unions and other stakeholders HSE dropped the campaign and disbanded the stakeholder group before the first meeting had taken place. A confidential HSE e-mail sent to the DfES shows this was so that the resources could be re-focussed on projects that are more likely to achieve Public Service Agreement (PSA) targets. HSE stated:

"Much of HSE's promotional and enforcement activities have been refocused on achieving PSA targets.

This has meant that the Education initiative no longer forms part of our present programme of work...."

In reviewing the portfolio of current campaign projects it is evident that a number of the initiatives would generate very limited results in terms of contributing towards the PSA targets associated with reducing exposures to asbestos, the key target for the asbestos programme; this includes the Education Sector project.

In view of this the initiative has been removed from the disease Reduction Programme....

An Exit strategy.

⁴⁸ Dust to Dust Eddie Rowe Trade unions technical advisor ILEA Asbestos Joint Working Party 27 Nov 1987

⁴⁹ HSE briefing for the Local Authorities Forum (LAF) Asbestos management in schools LAFORUM/04 23 November 2004.

The potential for unwelcome reaction to HSE's withdrawal is high and could prove very time consuming to address.." ⁵⁰

134. In November 2005 the Chief Executive of the HSE confirmed that the asbestos in schools campaign had been dropped so that the resources could be re-focussed on building and maintenance workers. He stated:

"Research shows that the group most at risk from asbestos exposures are building maintenance and repair workers.

We are in the process of revising our asbestos campaign...to more directly target this group...

The revised asbestos campaign, with its focus on effective management and protecting workers most at risk, along with the strategic partnership with DfES will provide the opportunities to help schools to meet their duties.

*Against this background, I feel that a separate HSE "asbestos in schools" campaign is not necessary."*⁵¹

Since then the asbestos incidents in schools have continued, whereas if the campaign had gone ahead many could have been prevented.

As at 10th June 2008 nothing constructive has been put in place to replace the defunct asbestos in schools campaign.

135. In April 2006 a survey was carried out in a special school in the Rhondda Cynon Taf where AIB ceiling tiles discovered. The school was a System built CLASP school. Air tests were undertaken and the school was closed. A spokesman for the council stated:

"Air quality tests have since been carried out in a cross section of areas of the school. All test results so far have confirmed the level of asbestos fibres present is below the maximum threshold limit to comply with Health and Safety guidelines.

*However the school is temporarily closed to pupils as a precautionary measure and further investigation is required to determine when the school can re-open for pupils"*⁵²

136. In June 2006 the Minister with responsibility for the HSE stated in connection to the Chief Executive of the HSE's decision to scrap the school's asbestos campaign:

"I also accept Mr Podger's decision not to have a campaign specifically focussed on asbestos in schools.

As he makes clear, HSE will continue to promote its message about avoiding exposures from asbestos fibres in schools. But they need to do this in the context

⁵⁰ E-mail HSE Asbestos Campaign Manager. Disease Reduction _Programme. Trevette/ DfES Daniels 1124 23 Aug 2005

⁵¹ Letter HSE Acting Chief Executive McCracken/Lees 22 Nov 2005

⁵² BBC News School closes after asbestos find. 7 April 2006

of their duty to protect all workers - particularly those where evidence shows the risks of exposure are high, such as maintenance workers. ...

I appreciate that this response will be disappointment to you.... However... I will not ask HSE to reconsider their decisions."⁵³

137. In July 2006 the investigation continued in the school in the Rhondda. Raised fibre levels were found when doors and windows were slammed and walls and columns hit. Levels were measured above the Control Limit. However at the time this information was not made public knowledge.

138. In July 2006 Scape were asked if they could provide information on the general levels in their schools as it was known that the school had shut because of raised asbestos fibre levels:

"Please do you know whether any evaluation has been made of airborne asbestos fibre levels in CLASP buildings?"

Scape's reply was as follows:

"No. This information will only be available from specialist contractors employed directly by the school or Main contractor when undertaking refurbishment works."⁵⁴

139. In August 2006 the asbestos problem was found to exist in six other schools and a community centre in the Rhondda. The schools were closed so that emergency work could be carried out.

"A £4 million programme of work to ensure RCT Council maintains its legal duties has identified eight buildings that need preventative and remedial work to deal with potential asbestos-related problems."⁵⁵

140. It took until October 2006 for a warning to be issued to other owners of CLASP schools. A "Joint message" from the HSE/ Local Government Employers (LGE) and the Department for Education was circulated to duty holders, a similar warning was issued jointly by Scape and HSE. This was six months after the initial school had been closed because of raised asbestos fibre levels, and three months after the source of the fibre release had been identified. In a press release HSE gave a very different impression about the speed of the official reaction:

*"In autumn 2006, the HSE identified that there was the potential for asbestos fibres to be released in particular circumstances in CLASP (System built)schools. HSE therefore, **took immediate and positive action,***

advising relevant duty holders to visually check their CLASP school buildings and, where necessary to seal gaps in column casings using silicone sealant and tape."⁵⁶

⁵³ Letter Parliamentary Under Secretary of State for Work and Pensions Lord Hunt of Kings Heath OBE/Lees 7 June 2006

⁵⁴ E-mail Lees/Scape Windle 16 Jun 2006

⁵⁵ Rhondda Cynon Taf Council.24 Aug 2006 Asbestos Ic Wales Schools shut in asbestos alert Aug 25 2006

⁵⁶ CLASP schools - statement by the HSE 15 Feb 2008

141. The circulars instructed authorities to identify whether their schools had the same problem and they gave guidance on remedial measures. Although at that time the guidance applied only to CLASP buildings it was implicit about the urgency to identify the problem and carry out remedial measures. The HSE/LGE/DfES document stated:

" This is an opportunity for you to take appropriate action to ensure that children, teachers and others are not exposed to asbestos fibres....

Clearly the sooner the issue is dealt with the better. The upcoming half term (as well as out of school hours) should provide you with the opportunity to assess the situation in your schools.⁵⁷

(Half-term in the Autumn of 2006 was 23 Oct-27 Oct)

142. Despite its limited targeting, the initial guidance of October 2006 gave practical advice on how to reduce the high fibre levels. As well as sealing the gaps in the columns skirting and walls, it advised that the gaps in the tops of the columns and the wall voids should be filled with expanded foam. It then instructed that air sampling should be carried out to confirm that the sealing had been successful.⁵⁸ Even then the average of the air tests carried out while the schools were occupied showed levels ten times higher than they should have been if the asbestos was in good condition. Some air tests gave levels that were more than twice the Clearance Level. Because air sampling was carried out it was identified where the sealing had failed to prevent the continued release of asbestos fibres, so that further remediation could then be carried out until acceptable the airborne levels were achieved.

143. On December 6th 2006 the Minister with responsibility for the HSE, confirmed that a group had been set up to specifically look into the problem in CLASP schools. Although various tests had proved that every day to day activities could produce significant asbestos fibre levels, at times above the Control Level, the Minister refuted the claim that these levels were dangerous to teachers and children. He stated in reply to a letter:

"I can confirm that a small group has been established specifically to look at asbestos control in CLASP schools.

Although there is no evidence that teachers and children have been exposed to dangerous levels of amosite fibres in these schools,

the group has been set up to consider the potential for asbestos fibre release and any guidance or advice (beyond that already available) that may be needed to ensure teachers and children are protected.

The issues raised as a result of the way in which CLASP schools were constructed are specific. It is therefore appropriate that the group looking at these issues has a limited membership and remit and a set timescale for completion of the work...

⁵⁷ A Joint Message from the HSE/LGE/DFES Asbestos- Potential for exposure in "clasp" school buildings. Undated, likely to be October or November 2006

⁵⁸ HSE Asbestos in CLASP and other System buildings. Guidance for duty holders produced by the HSE Asbestos in schools "CLASP" Working Group. Appendix

The establishment of this group does not mean that HSE has reinstated the asbestos in schools campaign or its corresponding stakeholder group".⁵⁹

144. In December 2006 HSE changed the group's name from "Asbestos in Schools Stakeholder Group"⁶⁰ to "Asbestos in schools "CLASP" working group." This change of name inevitably has led some authorities, school governors and even Government Ministers to believe that the problem is restricted to only CLASP schools, which is incorrect.

145. The first meeting was held on 13 December 2006. As has been seen the authorities intentionally restricted the scope of any investigation and guidance to CLASP buildings and in particular Mk4 and 4b, although it did mention that it could also apply to other Mks of CLASP buildings.⁶¹ However five months after the problem had been discovered they finally realised that the asbestos problem was common with many thousands of other "System built" schools. The minutes record that the terms of reference:

"extended the duties to other types of system built schools where the same scenario for potential fibre release exists."⁶²

This was crucial information and yet it took until March 2007 to issue guidance that warned local authorities and school authorities that the problem applied equally to all System built buildings constructed during the period 1945 -1980.⁶³ It appears that the CLASP Working Group members had become transfixed on just CLASP buildings when Scape, the Local Government employers (LGE) and HSE were fully aware that thousands of other System built schools were of a similar construction and contained large amounts of asbestos. In addition ILEA tests had proved twenty years before the problem in other types of System schools could be just as dangerous. It is inexcusable that both HSE and Scape took this length of time to warn the owners of the other thousands of System built schools.

146. On 13th December 2006 following the Working Group meeting the committee members remained to brief invited members of the "Education sector" on their deliberations and conclusions. Members of the "Education Sector" questioned the viability of the proposed plans of the Working Group. In particular they expressed their serious reservations about the proposed remediation, as it was considered that it could only be considered as a temporary solution. The HSE Head of the Services Sector who chaired both meetings stated that the sealing of the gaps with silicone sealant and sticky tape was the "*Rolls-Royce*" of solutions. She also stressed to members of the Working Group that she required "*Positive messaging*".⁶⁴

⁵⁹ Letter Parliamentary Under Secretary of State for Work and Pensions. Lord Hunt of Kings Heath OBE/Lees 6 Dec 2006

⁶⁰ HSE Draft TORs Asbestos in Schools Stakeholder Group 5 Nov 2006

⁶¹ A Joint Message from the HSE/LGE/DFES Asbestos- Potential for exposure in "clasp" school buildings. Undated, likely to be October or November 2006 para 1 joint message para 2 Potential for release

⁶² Asbestos in schools "CLASP" Working Group minutes 13th December 2006. Para 2

⁶³ HSE Asbestos in CLASP and other System buildings. Guidance for duty holders produced by the HSE Asbestos in schools "CLASP" Working Group.

⁶⁴ HSE Education Sector briefing 13th December 2006 . Contemporaneous notes Lees. No official minutes were taken, The NUT also took contemporaneous notes.

147. A further meeting of the CLASP Working Group took place on 26th February 2007⁶⁵. The title was changed once again to reflect :

*"The expanded remit of working group ie: encompass all "system" buildings in the public sector."*⁶⁶

At the meeting HSL presented the findings from air sampling in "system" buildings. Part of which was later published in April as the 1st HSL report "Summary of fibre concentrations in CLASP construction schools containing asbestos," other results were published in the later 2nd HSL report "Further measurements of fibre concentrations in CLASP construction buildings." HSL concluded that asbestos fibres would be released when the asbestos material was disturbed. Air sampling had been carried out which showed that the sealing of gaps in the columns significantly reduced the levels of fibres released. The average levels after remediation in the 1st HSL report were higher than they should have been had the asbestos been in good condition, with some levels being almost six times above the legal limit for a certificate of reoccupation to be issued for the classrooms.

148. The DfES representative on the committee is responsible for asbestos matters in all schools. He even questioned the need for any action, the minutes state:

*"Richard Daniels questioned the need for duty holders to take any action given the low level of risk indicated by the sampling results and in the light of what duty holders are already doing to manage asbestos."*⁶⁷

It is regrettable but this statement confirms DfES' fundamental lack of knowledge and understanding of the subject.

149. At the February meeting Scape were asked to provide HSE with details of owners of other System buildings, because HSE had realised that the problem applied not only to CLASP schools but also to thousands of other System built schools. Despite this, more than a year later in April 2008 HSE denied that they held any records of other System buildings. They were asked under the FOI :

"Please can you provide details of other types and Mks of System built schools of similar construction."

HSE replied:

*"I am writing to advise you that following a search of our paper and electronic records, I have established that the information you requested is not held by the HSE."*⁶⁸

This is a remarkable statement considering the information was requested by HSE as the asbestos problem applies equally to other System buildings. Yet more than a year later they claim that they hold no records. It is unacceptable that this vital safety information is not open for public scrutiny. Any owner of a System building should be aware of the make, the Mk and the asbestos content.

⁶⁵ Asbestos in schools "CLASP" Working Group minutes 26th February 2007

⁶⁶ Asbestos in schools "CLASP" Working Group minutes 26th February 2007 para 2.2

⁶⁷ Asbestos in schools "CLASP" Working Group minutes 26th February 2007 para 3.3

⁶⁸ Letter HSE Policy Group Longbottom FOI request/Lees 11 Apr 2008

CLASP specified locations of asbestos are known and hence the necessary management procedures can be implemented, but CLASP schools represent only a fraction of the total numbers of System built schools where the information is not readily available. Not only should the owners, but also every asbestos surveyor should have complete access to such information so that before they even start looking around the building they have full plans and specification of the manufacturers specified locations of asbestos and the likely locations where asbestos might have been additionally used at the architect's and builders discretion.

Instead most asbestos surveys identify the readily accessible asbestos and include materials such as sink pads, floor tiles and stair nosings but totally miss much of the inaccessible more dangerous asbestos hidden behind casings and in voids. If there was a centrally held library of all makes and Mks of System buildings and temporary classrooms then anyone responsible for asbestos management in a building could have ready access to the information. It would not only vastly improve asbestos management systems, it would mean that asbestos surveys could be more targeted and frankly the end result would be of more practical use.

150. Instead the information is treated as a national secret. In March 2007 HSE even instructed their divisions that the list of CLASP buildings was not to be disclosed if a request was made under the Freedom of Information Act (FOI). The instructions states:

*"The details of LA's with CLASP buildings are provided in the "schools" spreadsheet. This spreadsheet is closed for Freedom of Information purposes under section 30 - Investigations and proceedings conducted by public authorities."*⁶⁹

Government Departments therefore either claim that they do not hold the information and when they do they refuse access under disclosure clauses of the FOI. Most of the information is held by commercial companies but it is not readily accessible as they lie outside the scope of the FOI. Scape holds all the information on CLASP and also on various other makes of System buildings but they are a private company, and if HSE are correct they have not even given the information on other System built schools to HSE. All the other Consortia's information is also now owned by private companies so that they can also hide behind claims of commercial confidentiality. This is vital safety information that effects the very lives of millions of people, it effects our children. It is therefore unacceptable that the information is kept secret because of excuses of commercial and Government confidentiality.

151. In February 2007 the CLASP special school in the Rhondda remained closed as a major environmental clean up was required:

*"A Cynon valley school, closed after asbestos was discovered there, is to undergo a £1.3 million rebuild. A major environmental clean-up is due to be completed at Maesgwyn next month..."*⁷⁰

152. The working group issued guidance to all duty holders in March 2007.⁷¹ This was almost a year after raised asbestos fibre levels had forced the initial school

⁶⁹ HSE SIM 7/2007/04 Asbestos in CLASP and other system buildings. para 19iii

⁷⁰ IC Wales Refit of school shut by asbestos Feb 22 2007

to close and some eight months after it had been determined that walls, columns and ceilings were the cause of the raised fibre levels. The Working Group guidance failed to include much of the advice from the earlier guidance, as they no longer advised that the walls, wall voids, skirting and suspended ceilings had to be sealed, and the advice that the effectiveness of the seals had to be confirmed by air sampling was also removed.

153. An HSL report was published on 10th April 2007 summarising air tests that had been taken in twenty schools before and after remediation.⁷²

154. In March/April 2007 an instructions for HSE inspectors (SIM) was circulated to their inspectors and regional Heads of Operations. This provides a background to the subject and provides a course of action to be taken by HSE inspectors:

*"To ensure duty holders are complying with the law.
Provide assurance that they are managing this new asbestos issue..."*

The inspection approach would be enforcement based."

"Standards of compliance for management of asbestos are well established and there are clear enforcement expectations... However, given the vulnerable, non-occupational status of school children potentially exposed in this case the enforcement expectation is increased in line with the principles of HSC's Enforcement Policy statement."⁷³

"Inspectors are advised that the existence of un-sealed column casing gaps in any CLASP building should lead to an initial expectation of enforcement action..

where duty holders provide information on non-CLASP system buildings, their management arrangements and action taken should be assessed in the same way⁷⁴

Enforcement notices should be considered and prosecution should be considered as for CLASP dependent on the circumstances."⁷⁵

The SIM instructed Heads of Operations to provide an overall summary of completed work in October 2007.⁷⁶ The SIM stated:

"Heads of Operations are asked to provide an overall summary of the completed work in October 2007."⁷⁷

155. In May 2007 at their trial, Derby City Council were fined £50,000 with £20,000 costs for failures in asbestos management that led to widespread asbestos

⁷¹ Asbestos in CLASP and Other System buildings Guidance for duty holders produced by the HSE Asbestos in Schools "CLASP" Working Group" March 2007

⁷² HSL Summary of fibre concentrations in CLASP construction schools containing asbestos. HSL/2007/22 10 Apr 2007

⁷³ HSE Asbestos in CLASP and other system buildings SIM 7/2007/04 enforcement guidance para 21

⁷⁴ HSE Asbestos in CLASP and other system buildings SIM 7/2007/04 enforcement guidance para 23

⁷⁵ HSE Asbestos in CLASP and other system buildings SIM 7/2007/04 enforcement guidance para 24

⁷⁶ Asbestos in CLASP and other system buildings SIM 7/2007/04

⁷⁷ HSE Asbestos in CLASP and other system buildings SIM 7/2007/04 Summary

contamination and exposure of staff and children over the course of three weeks. Thirty windows and their AIB surrounds had been removed from the CLASP primary school with crowbars and power saws while staff and children looked on. The Headmaster was acquitted at his trial, however his lack of training and ignorance of asbestos matters was woefully inadequate. A court report stated:

" The Headmaster told the court that:

*" I knew you shouldn't take chunks of it and bite it, but I had no knowledge of asbestos, its capabilities or where it is found. It was a complete foreign language to me. "*⁷⁸

*The council were also criticised for not providing training to its staff, including teachers, with regard to asbestos. "*⁷⁹

156. In June 2007 a request had been made by John Denham MP for a Parliamentary debate to discuss the overall problem of asbestos in schools. The Schools Minister Jim Knight refused the request and stated:

*"We do not intend to hold a debate as we consider that asbestos in schools is being adequately handled by the Department for Education and the HSE. "*⁸⁰

157. A final meeting of the CLASP Working Group took place on 16th July 2007.⁸¹ HSE Head of Cancer and Asbestos Policy presented the findings of a second series of air sampling carried out by HSL in CLASP offices and schools. The results were a significantly less than had been found in the first series of tests in the Rhondda, both before and after remediation. They were an order of magnitude less than average background levels normally found in buildings with asbestos in good condition, and indeed less than fresh air - which is remarkable. The results are completely at odds with many other tests that have been carried out in System buildings, which raises questions about the selection of the schools, and the veracity of the results.

158. Because of the results of the 2nd series of tests the Working Group were able to conclude that the silicone sealing solution was completely successful. The findings were relayed to the authorities who are responsible for the Building Schools for the Future initiative (BSF). Most schools will be refurbished under the BSF and the initiative for primary schools. It is planned that 50% of secondary schools will be refurbished,⁸² and 95% of primary schools will be refurbished or have minor works carried out.⁸³ It is not mandatory that asbestos is removed when the schools are refurbished,⁸⁴ therefore it must be assumed that similar methods will be used to seal damaged asbestos materials, debris and fibres in the voids when the schools are refurbished.

159. The CLASP Working Group stated that their guidance would be updated by September 2007.⁸⁵ As at 10th June 2008 this has not happened.

⁷⁸ Newspaper Court report Bolitho 25 Nov 2006

⁷⁹ News paper Ex-Head thanks for public support. 30 Nov 2006

⁸⁰ Letter Minister of State for Schools Jim Knight MP/ Rt Hon John Denham MP 25 Jun 2007

⁸¹ Asbestos in schools "CLASP" Working Group minutes 16th July 2007

⁸² HCC strategy for change Key proposals for the FE estate part 1 070618

⁸³ Primary Capital Programme Bolton council 18 Jul 2006

⁸⁴ Conversation DfES Principal Architect C.Bissell/Lees 8 Mar 2006

⁸⁵ Asbestos in schools "CLASP" Working Group minutes 16th July 2007 para 3.2 Action.

160. On 16th December 2007 as part of an ITN investigation tests were carried out in a System built school in the London Borough of Brent. Asbestos fibres were ejected at levels above the Control limit when the columns were hit, the door slammed and the window sill disturbed. There were many gaps in the columns, ceiling tiles were missing, damaged and ill fitting throughout the school. There were holes in the walls, skirting boards were missing at the base of the column cladding. It was apparent that the system of asbestos management was woefully inadequate.

The council had done nothing to follow the guidance issued by the CLASP Working Group. HSE inspectors had failed to determine fact.

161. In January 2008 Brent Council finally undertook remedial actions, as per the CLASP Working Group guidance, and declared the school fit for reoccupation. HSE carried out an inspection and agreed that the school was safe for reoccupation, despite the fact that there were missing ceiling tiles and damaged AIB. Only a few of the tops of the columns had been sealed despite the fact that the ITN tests had shown considerable contamination of the ceiling void and that asbestos fibres were ejected out of the tops of the columns. On the 7th July the HSE case officer stated:

"The school has been perfectly safe, and the school is perfectly safe."⁸⁶

162. On the 10th January 2008 the HSE case officer issued two improvement notices to Brent Council. His covering letter runs contrary to his opinion that he had stated just three days before:

"Concerns were expressed to the HSE regarding Hay Lane school... This is a CLASP building where columns contain asbestos. It was suggested that the building was not safe for use and as such I visited to look into the situation further. I found that the columns in this building had not been remedied as advised by a document relating to all CLASP buildings made public in October 2006..."⁸⁷

163. In the interim he had made further enquiries about the asbestos management in schools in Brent and found it wanting. The covering letter and the Improvement Notices stated:

"Following the visit to Hay Lane school, I enquired about the management of asbestos in other schools, there were two reasons for this. Firstly, advice about CLASP schools had not been acted upon. Secondly, there was no evidence that inspections of the condition of known asbestos containing materials had been carried out. ...

the evidence so far suggests that the council are not fully meeting its duties to manage the risks from asbestos. Therefore I serve two Improvement notices."⁸⁸

The Improvement notices were as follows:

⁸⁶ Telephone HSE Inspector Bhunnoo/Lees 7 Jan 2008

⁸⁷ Letter HSE Field Operations Directorate London Division. Bhunnoo/ Brent Council 10 January 2008

⁸⁸ Letter HSE Field Operations Directorate London Division. Bhunnoo/ Brent Council 10 January 2008

4099016

All schools in the London Borough of Brent where you are the employer

*It was not possible to ascertain that asbestos containing materials (acm's), identified or suspected, had been inspected for condition, and therefore the possibility exists that **acm's could be in a condition which could cause exposure**"*⁸⁹

*The original document developed to manage asbestos was dated 2004 and had not been reviewed. As discussed earlier in this letter, **there is evidence that the systems in place to manage asbestos was not adequate.***

*Therefore, I enclose a second improvement notice serial number 4099017, **which will require you to put in place an effective system to manage the risks from acms.**"*⁹⁰

4099017

"All schools in the London Borough of Brent where you are the employer.

You are not effectively managing asbestos containing materials."⁹¹

164. In February 2008 despite overwhelming evidence to the contrary the Minister with responsibility for the HSE reiterated and defended his Inspector's initial statement that the schools had been and remained perfectly safe. He stated:

*"I can assure you that the history of testing at these premises show no evidence that staff or pupils had been exposed to asbestos at any time. The opinion expressed by the HM Inspector was therefore correct."*⁹²

Once again political expediency has resulted in Government Ministers playing down the very serious risks from the release of asbestos fibres caused by inadequate systems of asbestos management in schools.

165. In March 2008 DCSF again refused to reinstate the campaign to improve the asbestos management in schools, and instead supported HSE's decision to allocate the resources at maintenance contractors instead of schools. DCSF stated:

"Schools are not the only buildings where asbestos is present and HSE is committed to preventing exposure to all those people who may be at risk. Analysis of mortality data based on last occupation has directed HSE's current effort towards maintenance trades..."

*The HSE does not propose to have an "asbestos in schools" campaign."*⁹³

⁸⁹ HSE Improvement notice 4099016 Brent Council 9th January 2008

⁹⁰ Letter HSE Field Operations Directorate London Division. Bhunnoo/ Brent Council 10 January 2008

⁹¹ HSE Improvement notice 4099017 Brent Council 9th January 2008

⁹² Letter The Parliamentary Under Secretary of State for Work and Pensions. Lord McKenzie of Luton/Lees 19 February 2008

⁹³ Letter DCSF Public Communications Unit/ R. Lees 27 March 2008

166. In April 2008 the official with responsibility for asbestos in schools in the Department for Children, Schools and Families again, contrary to the evidence, denied that schools were not managing their asbestos. He stated:

" We do not agree with you that asbestos is not well managed in schools. On the contrary we believe that the evidence is that the majority of school employers and particularly Local Authorities are managing their asbestos responsibly..."⁹⁴

167. Twenty years ago tests proved that common everyday activities in a school could release dangerous levels of asbestos fibres into the classrooms, corridors and other rooms. The lessons were not heeded so that the release of asbestos fibres continued alongside frequent asbestos incidents in schools throughout the country. In 2004 following a series of asbestos incidents HSE realised that asbestos was not being managed in many schools with the consequence that staff and pupils were being exposed to asbestos. They therefore initiated a campaign to improve the asbestos management in schools. A year later it was scrapped so that the resources could be reallocated to the maintenance trades. The asbestos incidents continued unabated.

In 2006 the specific problem with System built schools was re-identified and emergency warnings were issued to seal in the damaged deteriorating asbestos with silicone sealant and sticky tape. The CLASP Working Group was established which issued guidance to schools in 2007 that not only played down the very real risks, but the guidance failed to include much of the previous advice and encouraged dangerous practice. In December 2007 Brent council had failed to implement any of the guidance in their System built schools with the consequence that dangerous levels of asbestos fibres were being ejected into the classrooms. HSE issued Improvement notices to the council for all of their schools because they were not effectively managing their asbestos.

Despite all the evidence to the contrary Government Departments and their Ministers continue to claim that asbestos was being, and is being well managed in schools, they claim that there never has been any risk and that there was no need for a campaign to improve the asbestos management in schools.

They have twenty years of evidence that shows that a significant number of schools are not effectively managing their asbestos. The result is that dangerous levels of asbestos fibres are being regularly released into the classrooms exposing staff and pupils.

How much more evidence do they need.

⁹⁴ Letter DCSF Schools Capital Division (Assets- School Design) Environmental Engineer Daniels/ R.Lees 24 Apr 2008

ANNEX 2. PART 1: TYPES OF SYSTEM BUILT SCHOOLS

System buildings

168. The Government's Valuation Office Agency (VOA) defines System buildings as follows:

"The term system building refers to a method of building based on forms of construction in which the component parts of the building fabric are wholly factory produced and site assembled.

The components relate to each other only as parts of a single integrated system of construction, usually related to a specific building type such as a school. Factory production removes fabrication from the site leaving only assembly operations to be performed, thus reducing the amount of skilled site labour required and reducing the time spent on site operations. This method, however, incurs the higher overhead expenses of factory production, the somewhat higher wages of factory operations and the charges of transport from factory to site.

Systems are at present based on skeletal structures in steel, concrete or timber or on loadbearing wall construction built up either from relatively heavy precast concrete panels ranging in size up to room height and width, or from light panels in timber construction which might be up to two storeys in height.

Systems are expensive to develop and most are proprietary and are marketed by the developer although a number have been developed by consortia, mainly of local authorities, co-operating with a manufacturer(s)".⁹⁵

169. There are many thousands of System built schools of different types which have used similar construction techniques.⁹⁶ Scape is the commercial trading company for the CLASP Consortium. They state:

"About half the school buildings in the UK are constructed using building systems. Most of the system built schools were constructed in the 60's and 70's."⁹⁷

When Scape were asked in September 2007 how many System built schools there were they stated that 46% of schools are System built.⁹⁸ There are about 26,000 schools in the UK which means that if Scape are correct then there are about 12,000 System built schools.

170. About a quarter of those are CLASP however the name has become synonymous with System buildings and is used as the generic term as Hoover has for vacuum cleaners. There are 3,155 CLASP (Consortium of Local Authorities Special Programme) buildings in the UK, most of which are schools, and up until at least 1980 considerable amounts of asbestos were specified in their construction,⁹⁹ although not a standard specification after that date its use

⁹⁵ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

⁹⁶ "CLASP" Working Group minutes 13 Dec 2006

⁹⁷ Scape School building overview www.scapebuild.co.uk

⁹⁸ CEO Scape System Build Ltd. Mackness 18 September 2007

⁹⁹ CLASP Asbestos awareness handbook March 2003 p7 www.clasp.gov.uk

continued albeit to a lesser extent. Although the problem that was identified in 2006 was at first thought by the Government, DfES, the Local Authorities Employers, HSE and Scape to only apply to CLASP buildings, eventually five months after the incident they realised that it also applied to other System buildings of a similar design.

171. In March 2007 HSE issued guidance to owners of other system/modular buildings. The guidance gives an idea of the scale of the problem:

" This guidance gives information about potential asbestos fibre release in CLASP buildings built between 1945-1980. However, it should be noted that the same issues are faced in all types of 'system built' buildings constructed during the same period.

Asbestos containing materials (ACMs) were widely used in 'system' buildings constructed during the period 1945 – 1980. Within all buildings of the period, ACMs were used extensively on pipe work, heating plant and other services, and as ceiling tiles and wall panels.

For example many of the 'system' buildings used lightweight steel frames that required fire protection, particularly in ground floor locations of multi-storey buildings. Asbestos insulating board (AIB) was used for this purpose.

Of a total number of 3134 CLASP contracts in the UK there are more than 1400 sites with CLASP built schools (some comprising more than one contract), distributed among 81 LEA/Children's Services Departments/Scottish Local Authorities. Independent schools own a small number of CLASP buildings. There are also small numbers of CLASP buildings across other areas of the public sector including local government, police, fire, MOD, health and railways.

Marks 2, 3, 3b, 4, 4b and early 5 CLASP buildings built between 1945 and 1980 may all contain asbestos materials, particularly mark 4 and 4b. Other 'system' buildings will have used similar construction techniques and are also likely to contain asbestos.¹⁰⁰

172. The specified locations of asbestos in CLASP buildings is detailed in the "Asbestos awareness Handbook" published by the CLASP Consortium in March 2003.¹⁰¹ This shows that considerable amounts of asbestos were specified in the construction of the schools, much of it being hidden in the structure.

173. It is known that asbestos deteriorates with age, water ingress, vibration from normal everyday use, impact, vandalism, vermin, botched maintenance, installing windows, installing cables, and white-board projectors, lack of maintenance and lack of an adequate asbestos management system and fair wear and tear amongst other means.¹⁰² It is also known that when the schools were built it was not uncommon to leave AIB off-cuts and debris in the ceiling, column and wall voids. As much of this material is hidden a standard asbestos survey will be

¹⁰⁰ HSE Asbestos in CLASP and other system buildings . Guidance for duty holders produced by the HSE Asbestos in schools "CLASP" Working Group - March 2007

¹⁰¹ CLASP Asbestos awareness handbook March 2003 www.clasp.gov.uk

¹⁰² Department of the Environment Asbestos Materials in Buildings 1983 paras 5.6, 5.7, 5.8 p 18, 19

unable to identify whether it is releasing asbestos fibres into the classrooms. Consequently the only means to establish whether this is occurring is by comprehensive air testing. Therefore to confirm whether this had happened in July 2006 Scape were asked:

"Please do you know whether any evaluation has been made of airborne asbestos fibre levels in CLASP buildings?"

Scape's reply was as follows:

*"No. This information will only be available from specialist contractors employed directly by the school or Main contractor when undertaking refurbishment works."*¹⁰³

Scape and the CLASP consortium are intrinsically entwined, therefore this lack of knowledge, and failure to collate data relating to the health and safety of the occupants of their buildings is unprofessional at the very least. It was just a month later that they were precipitated into action when the full scope of the asbestos problem in the Rhondda became apparent.

As the vast majority of the system built schools in this country are state schools one would have presumed that the Department of Education or the HSE would have held essential information that directly affects the safety of their ten million occupants. For without such information they are unable to determine the scale of the problem, allocate funds in proportion to the risk or advise local authorities and school governors on the matter. However at the time the Government claim that they do not hold such basic information. It has yet to be established but it is probable that the Government were aware of the 1987 ILEA tests, but for whatever reason failed to take any action.

174. Although asbestos in schools has the potential to cause harm on a large scale, there is an unacceptable lack of knowledge in key Government Departments about the numbers of system built schools in the country, their types, their asbestos content and the level of potential and actual risk. In 2004 the Government claimed that they did not even have figures for the numbers of CLASP and SCOLA school that had been constructed:

*"David Miliband
The Department does not have figures for how many schools were constructed using CLASP or SCOLA systems..."*¹⁰⁴

This lack of knowledge extends to the HSE. In January 2007 some six months after the discovery of high fibre levels in CLASP buildings HSE were also asked the numbers and types of school that have been built using other types of modular build. Despite the fact that by now they had realised that the problem extended to other system built schools, HSE replied:

*"This information is available from Scape System Build Ltd.
There will be other modular build systems outside CLASP/SCAPE method.*

*We don't have details."*¹⁰⁵

¹⁰³ E-mail Lees/Scape Windle 16 Jun 2006

¹⁰⁴ Hansard School buildings PQ 177591, 177592, 177593 David Miliband 14 Jun 2004

175. This was compounded by the fact that Scape also denied knowledge of asbestos in other system built schools. In 2006 Scape had been asked if they had information on asbestos used in the construction of other types of modular built schools and classrooms. They replied:

"We do not have details of asbestos used in the construction of other types of modular buildings"¹⁰⁶

176. This statement is surprising as the Scape web-site claims that they indeed do hold archive material on other types of modular/system buildings. As Scape offer that material for use in refurbishment and maintenance projects, it would be irresponsible if the documentation does not contain some details of asbestos used in the construction of the buildings. Scape state in relation to Method, SCOLA and Hills buildings:

- *"Method 1963 to 1988. South West area
The Method system had many aspects similar to CLASP.*

The Scape refurbishment programmes have been used successfully on these types of buildings. Scape has archive material which may be of assistance to owners of Method buildings wishing to carry out refurbishment projects."

- *SCOLA 1962 to 1990
The Second Consortium of Local authorities after CLASP has similar principles to CLASP.*

The Scape maintenance programmes have been used successfully on these types of buildings. Scape has archive material which may be of assistance to owners of Method buildings wishing to carry out refurbishment projects."

- *Hills 1944 to 1963
Hills buildings were a post war forerunner of the CLASP and SCOLA systems. It was privately owned. Scape has archive material which may be of assistance to owners of Hills buildings wishing to carry out refurbishment projects."¹⁰⁷*

177. When Scape were asked in September 2007 how many System built schools there were they stated that 46% of schools are system built.¹⁰⁸ That is a very precise figure and indicates that they have the actual numbers. As the information that Scape has in its possession has crucial health and safety implications, it is important that all that information is placed in the hands of the HSE, Department for Education and the teaching unions. As it effects the occupants of thousands of schools all information should also be released for public scrutiny.

178. At the February 2007 CLASP Working Group meeting Scape were asked to provide HSE with details of owners of other system buildings, as HSE had finally realised that the problem applied to thousands of System built schools as well as CLASP. It is not known if Scape provided this information to HSE, however in

¹⁰⁵ HSE Cancer & Asbestos Policy Unit/ Lees FOI request 2007010226 15 Jan 2007 Annex 1q 18, 19, 20

¹⁰⁶ E- mail Scape Architectural Technologist, Windle/Lees 1 Jun 2006

¹⁰⁷ Scape web-site Building Systems. www.scapebuild.co.uk

¹⁰⁸ CEO Scape System Build Ltd. Mackness 18 September 2007

April 2008 HSE denied that they held any records of other System buildings. They were asked under the FOI :

"Please can you provide details of other types and Mks of System built schools of similar construction."

HSE replied:

"I am writing to advise you that following a search of our paper and electronic records, I have established that the information you requested is not held by the HSE."¹⁰⁹

This is a disturbing statement considering the information was requested by HSE and yet more than a year later they claim that they hold no records. By October 2007 HSE should have checked that all System built schools had complied with the Working Group guidance, quite how they intended to do that when they profess that they do not even have the most basic details raises further questions.

179. Between 1945 and 1975 about 13,000 schools were built when the use of asbestos was at its height.¹¹⁰ Many of these schools were built using "Modular" or "System" building techniques where the main structure was prefabricated and assembled on site. The structural framework was frequently lightweight steel girders that had the potential to buckle in a fire, consequently the girders were protected by AIB cladding, in addition fire protection was provided with AIB ceiling tiles and wall panels in vulnerable locations. Other types used aluminium, a timber frame structure, or reinforced stressed concrete. All needed fire protection.
180. Since 1945 thousands of system/modular schools built schools have been constructed, of many different types and makes. In the early 1960's there were 400 different commercially sponsored building systems for offices, factories, hospitals, houses and schools, and various other local authority consortia designs.¹¹¹ Some like CLASP were local authority sponsored consortia designs specifically established to build schools, others were commercially sponsored designs. Many if not all of the following contain asbestos. However the locations and quantities have only been established for this paper in CLASP buildings. It is possible, although unlikely, that some included in the list do not contain asbestos. The list is not comprehensive but will be added to as information is acquired.

Increased fire risk in System built schools. Sprinklers not installed because of asbestos

181. Although this paper is about the asbestos risk in System built schools there are other equally disturbing aspects concerning the safety of schools constructed in this manner. The main concern is that a design fault allows the rapid spread of fire, despite the fact that the use of asbestos was meant to counter this. Instead its very presence has severely hampered attempts to bring thousands of System schools up to safe standards. There are many quotes from various local authorities and the Fire Service, a few are as follows:

¹⁰⁹ Letter HSE Policy Group Longbottom FOI request/Lees 11 Apr 2008

¹¹⁰ HSE Briefing to the Local Authorities Forum 23 November 2004

¹¹¹ Building systems and Portable Buildings The rise and fall of the building system Marsh p1.226 1984

"Fire Authority report 18 March 2006:

*Twelve appliances attended a severe fire at Penyreol Comprehensive school..... The school had been a three storey building ... housing about one thousand pupils and staff. The blaze spread rapidly through the school due to its "CLASP" construction ("CLASP... was basically a building construction technique introduced post-war and popular in the 1960's for short-term, cheap and easily constructed buildings such as schools, fire stations, libraries etc. CLASP buildings of wood and concrete panel construction encompass a vast number of hidden voids through which fire is able to travel rapidly, unseen and unchecked.)"*¹¹²

Fire Officers Association. Fire sprinklers save our schools

*"School fires are a national problem. Every year 2000 schools in Britain are damaged by fire.... The majority of school fires are occurring during term-time and normal school hours..."*¹¹³

Coventry City Council

"Coventry City Council, in common with many other local Education Authorities, was a member of a consortium which used a modular construction system in order to produce schools cost effectively.

Unfortunately this type of construction, CLASP, is known to be a significant contributor to the spread of fire throughout the premises due to the non standard construction and the lack of fire breaks within the roof voids and the wall cavities....

Owing to insurers' concerns over the enhanced fire risk in CLASP and other lightweight construction schools....

*By voluntarily adopting some fire stopping in key schoolsUnfortunately the work has been subject to a number of delays and identification of asbestos at the schools has meant that the costs have increased by approximately £50,000."*¹¹⁴

Leeds

Fire stopping/separation in Consortia constructed schools

Consortia type school buildings, typically Scola and Clasp type construction, offer high levels of risk in terms of property loss due to the lightweight construction and the undivided nature of the ceiling and roof voids. In such building types, relatively small fires can develop and spread extremely rapidly and extensively....

*Significant attention will be required with respect to the impact of asbestos containing materials both within and encapsulating such voids...."*¹¹⁵

Zurich Insurance

*"School fires often involve the release of asbestos and other contaminants contained in water run-off. This will not happen if a sprinkler system is installed."*¹¹⁶

¹¹² Fire Authority report April 2006 Swansea County Command

¹¹³ Fire officers association The National Fire sprinkler network 2002

¹¹⁴ Coventry City Council Public report 7 16 Nov 2005

¹¹⁵ Education Leeds Capital scheme 12383 Sep 2005

¹¹⁶ Zurich Why install sprinklers in schools? a cost benefit analysis.

Wakefield

Sprinklers deal with a blaze immediately, save money, improve effectiveness and save lives...

Sprinkler systems are expensive to install within existing buildings since they require a network of pipes throughout the building This is very disruptive to the building fabric with installation work above the ceiling and may involve asbestos removal prior to installation.

Having considered the evidence we conclude that installing sprinklers in all our existing schools would be too expensive.

CLASP buildings- Many of the Council's schools were built in the 1960s and 1970s. Because of the design it is more difficult to install sprinklers to this type of building, although not impossible. These buildings have particularly poor compartmentation and as such present an increased fire risk. We would recommend that these schools are prioritised in any capital building replacement programmes, such as the Building Schools for the Future initiative."¹¹⁷

Worcester

We conclude that the costs of installing sprinklers in all existing schools is too expensive for the County to bear and do not recommend installation in existing schools."¹¹⁸

Fire Officer

"Another big problem is that many are CLASP type buildings with interconnecting voids and cavities especially between floors and above ceilings. Once the fire gets going in the voids it is almost impossible to stop."¹¹⁹

Asbestos was used in System built schools to prevent the spread of fire and the collapse of the building, but it has been proved on many occasions to have failed completely with the resulting total loss of schools. It is ironic that having failed to achieve what it was meant to do, its very presence is now the main reason that sprinkler systems are not being installed, for the decision is being taken by some councils that the expense of the necessary asbestos remediation would be prohibitive, instead they are willing to accept the considerable risk from fire in their existing System built schools.

List of different types of system built schools

Permanent buildings

- CLASP. Consortium of Local Authorities Special Programme. CLASP and CLAW are the only Consortia remaining in existence. On 1 April 2006 SCAPE became the commercial trading company for the CLASP Consortium.

¹¹⁷ City of Wakefield Fire safety in schools Report of the lifelong learning overview scrutiny committee May 2005

¹¹⁸ Worcestershire County Council Resources scrutiny panel Sprinklers in schools and other council buildings

¹¹⁹ Firenet Forums Principal member Matlock 15 Nov 2005

3,155 built. The majority were schools. 1957-2005. Until 1980¹²⁰ asbestos was used as a standard specification. Mks 2-5 contain asbestos. Including AIB cladding on steel columns. Window surrounds and infill panels AIB on most Mks.¹²¹

Some local authorities don't have any CLASP buildings, whereas others have many. As an example Nottinghamshire has about 728 CLASP buildings of all Marks. 600 are schools.¹²²

Derby has 66 schools of all Marks.

Derbyshire has 249 CLASP buildings. 200 are of Marks that have asbestos materials specified in their construction.

There is an inherent fire risk in many Mks of CLASP buildings:

*"This type of construction, CLASP, is known to be a significant contributor to the spread of fire throughout the premises due to the non standard construction and the lack of fire breaks within the roof voids and the wall cavities..."*¹²³

- SCOLA. Second Consortium of Local Authorities. 2,000 built. All were schools. 1961-1990. Steel frame construction similar to CLASP.¹²⁴ Contains asbestos, quantities, locations and type under current FOI request.

*"The Pillar Consultancy was inaugurated in 1989, and is the successor organisation to SCOLA. It now administers the SCOLA steel frame and component arrangements."*¹²⁵

SCOLA recladding developed by Hampshire Property services Department in partnership with SAPA building systems Ltd. Wessex window systems Ltd and Structural engineers The Anthony Ward Partnership.¹²⁶

*40% of schools in Hampshire are of SCOLA construction...25% of national total. Timber clad external elevations. Expected lifespan 25 years. Built over fourteen years from 1960s to 1970s to accommodate London overspill¹²⁷ Hampshire has 449 SCOLA buildings. "Asbestos panels require high levels of maintenance. Fire precautions do not meet modern standards."*¹²⁸

*20% of Hampshire's early SCOLA design. "Unless remedial work is carried out it is unlikely these schools would meet the requirements of the Building Regulations today. In particular the need for fire compartmentation would almost certainly be deficient"*¹²⁹

¹²⁰ Scape asbestos awareness handbook p7 Mar 2003

¹²¹ CLASP Asbestos Awareness Handbook Approximate dates for various Marks. Asbestos in CLASP Standard Details . Not specified but sometimes found in CLASP Buildings. Appendix 2. Mar 2003

¹²² CLASP Working Group Minutes Nottinghamshire Surveyor Morley 13 Dec 2007 para 4

¹²³ Coventry City Council Public report 7 16 Nov 2005

¹²⁴ www.scapebuild.co.uk Building systems. www.pillarconsultancy.com Information.

¹²⁵ www.scapebuild.co.uk Building systems. www.pillarconsultancy.com Information.

¹²⁶ www.hants.gov.uk Hampshire County Council. Press release 22 Dec 2005

¹²⁷ www.hants.gov.uk Hampshire County Council. Press release 22 Dec 2005

¹²⁸ Hampshire archive Concern over crumbling schools 21 Mar 2000

¹²⁹ Arson in schools Chief Executive of the Association for specialist Fire Protection www.labc.uk.com Summer 2007

- Method. 1963 -1988. Local authority consortium South West of England.¹³⁰ Based in Taunton 6 Full members, 3 Associate members. Schools in the South West.¹³¹

Many aspects similar to CLASP.¹³² An asbestos survey shows that some of the column casings had AIB cladding.¹³³
- Onward. Local authority consortium.¹³⁴ Organisation of North West Authorities for Rationalised Design. Established 1966 in Preston. 25 members. Schools from the Solway Forth to the Mersey.¹³⁵
- MACE. Local authority consortium.¹³⁶
- SEAC. Local authority consortium.¹³⁷ South Eastern Architects Collaboration.¹³⁸ Based Epping. Established 1963. 5 Full members 10 Associate members. Various Mks.¹³⁹
- CLAW Local authority consortium.¹⁴⁰ Consortium of Local Authorities Wales. Established 1962.¹⁴¹ A report in a professional journal on Consortia building systems states:

"They were all initiated with the original intention of providing educational buildings....CLAW. It has a research and development group whose objectives are to promote a comprehensive building policy for local authorities in Wales. Its main aims are to rationalise and interchange building components, to develop building methods, to achieve economies in professional time and to provide an extensive technical information service."¹⁴²

CLAW still exists, therefore they were contacted and asked to supply information under the Freedom of Information act. The following is correspondence with the Chairman of CLAW:

"CLAW exists as an organisation to support local authorities in Wales in relation to professional and technical aspects of property management. Much of this is by way of the sharing of best practice, arrangements for training and development, and the preparation of standard documentation etc.

CLAW, as an organisation, does not hold the type of information you request in relation to individual schools, or other buildings, within each local authority area. You would need to request the information you are seeking in relation to school

¹³⁰ www.scapebuild.co.uk SCAPE web-site Building systems.

¹³¹ Architects Journal 1975

¹³² www.scapebuild.co.uk SCAPE web-site Building systems.

¹³³ Bath and North East Somerset asbestos survey drawing E070/02/02 . Block 3 incident number 4938 Amosite column casings

¹³⁴ www.scapebuild.co.uk SCAPE web-site Building systems.

¹³⁵ Architects Journal 1975

¹³⁶ www.scapebuild.co.uk SCAPE web-site Building systems.

¹³⁷ www.scapebuild.co.uk SCAPE web-site Building systems.

¹³⁸ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹³⁹ Architects Journal 1975

¹⁴⁰ www.scapebuild.co.uk SCAPE web-site Building systems.

¹⁴¹ www.claw.gov.uk CLAW web-site

¹⁴² Building systems Consortia systems CLAW 1980 p 1.253

*buildings individually from each local authority in Wales, for the buildings within each local authority area.*¹⁴³

- Hills. The architects were from Hertfordshire County Council. Privately owned. In 1947 the first school was built by Hills Ltd. Hills went into receivership in 1962.

400 built. All were schools. 1947-1962. Galvanised steel frame construction.¹⁴⁴ Contains asbestos, quantities, locations and type will be part of an FOI request. An incident in a Hills school in Derby produced raised asbestos fibre levels when air sampling was carried out in October 2007. It appears that this was when an assessment was being made of cracks in wall panels.¹⁴⁵ Contains asbestos, it is thought in similar quantities and locations as CLASP buildings, although this has to be confirmed.

As an example: Derby has 11 Hills schools.¹⁴⁶
Hertfordshire has about 100 Hills schools.¹⁴⁷

- Vic Hallam. 1918-1995. Privately owned. Since 1995 Callam Ltd now own the project files for existing Vic Hallam buildings from the 1960.¹⁴⁸

First 18 prefabricated classrooms manufactured 1952. First school built 1952. The Derwent system is timber framed and suffers structural problems.¹⁴⁹

- ORLIT. Pre cast Concrete frames.¹⁵⁰
- Laingspan. Post tension pre-cast frame, concrete cladding.¹⁵¹
- Spooner. Timber framed and clad.¹⁵²
- Simms son and Cook. Timber framed¹⁵³
- Onward. Organisation of North West authorities for Rationalised Design.¹⁵⁴
- Pratten. Timber framed¹⁵⁵
- Bristol. Bristol Aircraft Corporation. Aluminium frame and cladding.¹⁵⁶

¹⁴³ E-mail CLAW Chairman of board of nominated officers Barton 5 Nov 2007

¹⁴⁴ Hills schools cladding the problem . Kingsbury 2000

¹⁴⁵ Derby Evening Telegraph. Pupils told to stay home after asbestos found in classroom. Hawley. 9 Oct 2007.

¹⁴⁶ Cerby City council types of school buildings

¹⁴⁷ Hills schools cladding the problem . Kingsbury 2000

¹⁴⁸ Callam Ltd

¹⁴⁹ The Institute of structural engineers Vic Hallam Timber framed Buildings .Forum April 2007

¹⁵⁰ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵¹ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵² Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵³ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵⁴ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵⁵ Callam Ltd

- ASC. Local authority consortia. Anglia Standing committee. Note: These are of conventional construction. Cambridgeshire, Bedfordshire, Humberside, Norfolk. Dimensionally coordinated .¹⁵⁷
- Austin -Hall Ltd. Prefabricated timber framed method of system building which offers a high degree of flexibility, wide range of cladding, brick glass, GRP or concrete. .¹⁵⁸
- Boulton and Paul Timber Ltd. Single and two storey buildings used extensively by hospital and education authority. Flat or pitched roofs. Flat roofs are box beamed construction with built in falls with ply-faced decks. Walls are post and panel. Available in 24 variants timber framed windows and plywood or cedar cladding.¹⁵⁹
- Lesser building systems. System dimensionally co-ordinated. Single or two storey. Minimum of onsite labour. Multi spans using either flush or exposed beams with steel supporting columns either free standing or concealed in walls. Variety of claddings. .¹⁶⁰
- Stonere System Buildings Ltd. Factory made panels erected on site. Timber floors or solid floors. Frames timber and vertical studs. Various claddings, brick, stone or tile hung outer skin.. coloured steel, simulated tongue and grooved Douglas Fir GRP, Cedar boards. Pitched or flat roof. .¹⁶¹
- Swiftplan Ltd. Factory produced engineered buildings schools, hospitals and offices. Single and two storey. Post and panel open web beams. Finishes include foil backed plasterboard to wall panels and ceilings. Exterior variety including Hardboard, and brickwork. .¹⁶²
- Terrapin Ltd. Mk 72 mostly factory finished, rigid frame of timber and steel. Folded into pack delivered to site. Erection rapid and simple. Mono-pitched roof.¹⁶³
- Translink Ltd. Open plan system for nursery education. Fraction of cost of conventional building. Buildings of any size or shape, bays can be added. Nursery equipment can be supplied. .¹⁶⁴

¹⁵⁶ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁵⁷ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁵⁸ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁵⁹ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶⁰ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶¹ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶² Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶³ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶⁴ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

- Warnick and sons. Warnick systems WS88. Timber framed system. Single or two storey. Pitched or flat roof. Column and beam type construction with non-load bearing walls. Large variety of cladding including brickwork, red cedar, sprayed aggregate, plywood, coloured asbestos.
- Youngman system buildings. Timber frame system. One or two storeys. Timber post support steel lattice roof beams or timber box floor beams. External walls non-load bearing plywood infill panels. Timber cladding or brick facing. ¹⁶⁵

Temporary classrooms

182. As well as the permanent buildings, there are "temporary" classrooms manufactured in factories and either transported as complete units or assembled on site. Post WW11 a large number of temporary classrooms were rapidly put in place to cater for the increased need for post war classroom space. In 1980 it was estimated that there were probably 100,000 temporary classrooms in England and Wales.¹⁶⁶ Many, if not most, contained asbestos, it is known that in some all the internal walls and ceilings were AIB.¹⁶⁷ Some of these pre 1980 classrooms remain in use today.

183. In 2004 a Parliamentary question determined that there were 6,761 schools in England that had one or more temporary classrooms.¹⁶⁸ It was not stated how many were erected pre 1980. Although these classrooms would not have had the same structural problems as the "permanent" system built buildings, it is inevitable that the reverse face of the internal AIB walls and panels would release fibres into the void when they are knocked. These would filter out through any gaps. Only realistic disturbance testing with comprehensive air sampling will determine if there are raised levels of airborne asbestos fibres in these classrooms.

184. The following is a recent quote about temporary classrooms which contain asbestos, inevitably it is typical of many others which over the years have suffered from lack of maintenance and inadequate asbestos management. This quote shows how an inadequate survey is counterproductive as it lulls people into a sense that all is well. It is also apparent that there was no system of asbestos management. Temporary classrooms by their very nature are more prone to vibration and movement than permanent buildings, consequently any asbestos they contain will release asbestos fibres more readily. The quote is as follows :

Primary school

"The mobile hut contained two classrooms separated by a small lobby. They were in poor condition with evidence of weathering, leaks and gaps in ceiling tiles (not asbestos)... the survey described condition/surface treatment of asbestos (crocidolite) panels in classroom walls as minor damage, sealed.

Recommendation "manage."

¹⁶⁵ Journal of Building Systems and portable buildings. 19801-241- 1-253. 1-226- 1-241 1984

¹⁶⁶ Building systems and Portable Buildings Education p1.241 1980

¹⁶⁷ Devon County Council Single Terrapin asbestos survey 23137 6 Mar 1985, updated 23 Mar 1998. Bath asbestos survey Elliott E076/03/ASB/18 6 Nov 2007

¹⁶⁸ Hansard written answers 161907 Temporary classrooms. 18 Mar 2004

I noted an interactive whiteboard equipment had been fixed into these asbestos panels in each classroom indicating that there was no effective school asbestos management plan. Each classroom contained 30 pupils and was used for wet play where activities can be boisterous and potentially lead to scuffing and vandalism of asbestos panels. Chairs could also be located close to walls leading to scuffs and vandalism during lessons. In one of these classrooms the teacher had pinned displays to ACM wall panels. HSE/NUT advice had evidently not been heard or otherwise it was not heeded.

The lobby contained asbestos panels in the partition walls to classrooms. ...The required encapsulation had been completed before I inspected. The lobby was used for storing coats and at the beginning and end of lessons could be crowded theoretically with up to 60 pupils. There was evidence of serious wear and tear with scuff marks and scrape marks near pegs. In one wall I saw fibrous material protruding out of the wall. Evidently contractors had ripped out piping some years earlier leaving exposed asbestos fibres wherever they had been screwed into the asbestos panels. E...E...in their Type 2 survey in 2007 had tested the ones they could see and then encapsulated them. The exposed asbestos that I saw had been hidden by a small 2-drawer filing cabinet and so had not been noticed."¹⁶⁹

185. The Council acknowledged that there was a problem when the NUT confronted them. Although measures were put in place, the council did not immediately close the classrooms instead they just suggested restricting the numbers of children using them. From this incident and others the council demonstrate a casual disregard of the dangers from asbestos, particularly in this case where primary children were potentially being exposed to crocidolite. Staff and pupils had been taught in these huts over a prolonged period, during which time the release of crocidolite fibres would have been inevitable. A site visit report by the council stated:

" Of the three hutsone is currently being used as a double classroom, one is used for small groups and one is used for storage.

All are suffering from years of neglect and lack of effective maintenance resulting in the storage hut being in a state of near collapse. The remaining two huts are not much better.

All three huts leak water and are draughty. There are signs of movement within the huts, indicated by gaps in door frames and window frames, gaps between wall panels and evidence of roof leaks at joints. Given the known asbestos content of the huts, effective sealing and control is not possible and the release of fibres cannot be adequately eliminated.....

Further encapsulation would have limited effect as gaps between AIB wall panels combined with the draughts caused by the condition of the huts allows any fibres from wall cavities to be released into the classrooms.

The Headteacher and Caretaker have been advised to obtain some silicon sealant and attempt to fill and seal gaps between panels in the huts still in use. This would only be a temporary measure given the amount of movement from huts 'panting' and vibration from people moving from normal use.

¹⁶⁹ Name of school withheld but available 28 Apr 2008

On close examination of the condition of the hut currently being used as two classrooms, the outer shell of the building is rotten to the point where little force is required to allow a finger to penetrate into the wood of window frames and other areas. This is resulting in window panels becoming unseated and gaps forming allowing wind and water penetration into the wall and ceiling voids. This is resulting in weather disturbance to the back of the AIBs and fibre release into the wall and ceiling void areas.

Any further damage to internal walls poses such a risk of asbestos being released into the environment that the building would have to be closed, isolated and specialist contractors engaged to repairs and provide reassurance air testing. Given the sensitivity the NUT have at this time, persuading teachers to return to 'normal' teaching in these huts following such an incident, would be difficult.

Further deterioration in the condition of the huts is inevitable. This will bring an unacceptable and avoidable risk of asbestos fibre release not only into the classrooms but also the environment.

The Author recommended the Headteacher explore possibility of rearranging classrooms to enable just small groups to use the huts until their replacement.¹⁷⁰

18 March 2008

186. The following list of temporary classrooms is not comprehensive.

List of types of Temporary classrooms

- Elliott Medway timber framed.¹⁷¹ This is classed by VOA as a Temporary System building. Relocatable¹⁷²
- Elliott An asbestos survey lists the asbestos in an unknown Mk "*Generally Ceiling panels throughout. Generally wall panels throughout. Generally glazing gaskets to aluminium frames. Generally soffitts. Flue panel.*"¹⁷³
- HORSAs. Hutted Operation for the Raising of the School Leaving Age. Concrete portal frame/concrete or hollow cladding.¹⁷⁴ These huts were erected after WW1 and were frequently ex military barrack rooms. The roofs were frequently asbestos cement, the ceilings could be AIB. System of heating could contain asbestos materials.
- Terrapin. Since 1949. In 1950's Terrapin Mk 36 factory manufactured system was a complete classroom unit. Classroom of choice for "baby boomers." Leaving factory every 20 minutes. In 1970's new construction technologies combined with traditional build, with steel frames.¹⁷⁵ Asbestos surveys of two Terrapin

¹⁷⁰ Site visit report Local authority name withheld but available 18 March 2008

¹⁷¹ Callam Ltd

¹⁷² Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1. Elliott Group www.elliott-group.co.uk

¹⁷³ Asbestos survey Bath NE Somerset Ralph Allen school 6.Nov 2007

¹⁷⁴ Valuation Office. Executive agency of the Inland Revenue. Local authority and other maintained schools System building types Rating Manual - volume 5 Section 590; appendix 1

¹⁷⁵ www.terrapin-ltd.co.uk Terrapin. Modular construction temporary building solutions.

temporary classrooms list the walls, ceilings and heater plinth as AIB
Asbestolux.¹⁷⁶

- Holder.¹⁷⁷
- Andover.¹⁷⁸
- Youngman¹⁷⁹
- Halls Robert¹⁸⁰
- Middlesex (lesser)¹⁸¹
- Bryant &Trowbridge.
- Devon Lady.¹⁸² External soffitts AIB. Flue surrounds AIB. Roof hatches AIB. Roof felt , floor tiles. Heater backing board AIB¹⁸³ Toilets asbestos cement wall boards. corrugated asbestos cement roof . Ducting at rear of heater AIB¹⁸⁴
- Ministry of Works.¹⁸⁵
- Medway.¹⁸⁶
- Warnick.¹⁸⁷
- Medway¹⁸⁸
- Swift Plan.¹⁸⁹

¹⁷⁶ Devon County Council Bideford Junior school. asbestos surveys 47159, 43848, 45558 23 Mar 08,

¹⁷⁷ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁷⁸ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁷⁹ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸⁰ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸¹ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸² www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸³ Asbestos survey Devon county Council Bluecoats infant school Torrington

¹⁸⁴ Asbestos survey Devon county Council Sutcombe primary school

¹⁸⁵ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸⁶ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸⁷ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸⁸ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

¹⁸⁹ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3

- Austin Hall/Clifton¹⁹⁰

Michael Lees
12th June 2008

Further information is required. Please if anyone can provide authoritative documents relating to asbestos in System built schools and temporary classrooms it would be greatly appreciated.

Email: ml@asbestosexposureschools.co.uk

¹⁹⁰ www.hants.gov.uk Hampshire County council Buildings and grounds panels Temporary buildings 22 March 1994. Temporary buildings in Poor or Very Poor condition. Appendix 3