



Mapping health hazards and risks across aspects of the construction process

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This report reviews the current state of knowledge of occupational health issues within a sample of companies from the construction industry, and the feasibility of applying the COSHH Essentials approach (HSE, 1999) in the Construction Industry. It also considers a structured approach to mapping health hazards across the construction process. The survey included six companies from Scotland, six from England, and a range of construction processes.

The results of the study indicate that there is a broad range of risks to health associated with the observed construction processes. All of the sites visited had only limited controls in place in relation to the hazards observed, and the need for risk reduction measures was indicated in most cases. Individuals observed during the study tended not to attribute pre-existing conditions to the work environment.

There is a need for consistent and simple systems to allow monitoring of data on work-related health within the industry. The study highlighted the need for further education initiatives on work and health in the construction process. The industry is striving to achieve good practice in safety at work, but this is not yet established for health, and may be due in part to lack of understanding about the relationship of these two factors.

It is considered that a simple audit tool based on a modified version of the COSHH Essentials format could be introduced for specific aspects of the construction process. This could be incorporated into a simple recording format to be used to collect and collate baseline data on health in the construction industry.

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SUMMARY

BACKGROUND

It is acknowledged that information on occupational health in the construction industry is at best sparse and scattered. Recent legislation such as the Construction, Design and Management Regulations (HSE, 1994) has primarily focused attention on safety issues in encouraging a more structured approach to risk assessment and the development of a health and safety plan.

This report reviews the current state of knowledge of occupational health issues within a sample of companies from the construction industry, and considers the feasibility of applying the COSHH Essentials approach (HSE, 1999) within the Construction Industry. It also considers a structured approach to mapping health hazards across the construction process, by the use of an audit based approach applied across a range of industry sizes and construction processes.

The tool developed for use in the survey aimed to provide a framework for collecting information about health hazards associated with tasks within each construction process. Together with background data from the companies this information was collated to identify specific health hazards associated with each process. This information was then used to construct a simple checklist that could be used by the construction industries themselves to identify the occurrence and frequency of health problems within their own company. Observation of specific tasks was confined to the finishing of internal surfaces. Tasks at other phases of the construction process were not included in this study.

The survey included six companies from Scotland, and six from England. The range of construction processes covered included commercial construction projects, residential and public sector new building projects, and refurbishment of both public and private sector buildings. The number of staff on site ranged from 3 to 70 full time staff, and from 10 to more than 300 subcontractors. This clearly has implications for the consistent application of health based policies and procedures on sites.

MAIN FINDINGS

All the companies had health and safety policies in place and associated documents. However the frequencies at which these were revised was variable, and in practice they were not used as an active source of information. Eight of the twelve companies made these documents available to subcontractors. Eleven companies had some form of pre-contractual assessment of subcontractors, but policies on pre-contract agreements varied, with some companies requiring specific proof of competences, and health and safety procedures to be applied to the job. However, in some instances the start-up information required of contractors was negligible.

Sites also varied in relation to the level of health and safety expertise that was available on site. Most companies had a full time Safety Manager (not permanently on site), and one of the companies reported having five full time staff in this role. In the main Safety Managers visited sites on a cyclical basis, often monthly. Many sites reported not having safety representatives on site. Two sites reported having a site-specific project manager, with responsibility for health and safety. Apart from this responsibility for health and safety implicitly rested with line management on site

In general although there was a difference in the level and provision of safety management systems across the companies visited, there was little current emphasis on health-based problems within the workplace. There also appeared to be limited understanding among employees working with the companies of the nature of possible occupational health problems which might be associated with the tasks they were undertaking

Although there was a difference in the level of sophistication and provision of safety management systems across the companies, there was little current emphasis on health within the workplace. There appeared to be only limited awareness and understanding among employees in the companies visited of the type of occupational health problems that might be associated with the tasks they were undertaking.

All the companies provided safety data sheets. Limited airborne monitoring data were available, and it was not common policy to undertake this type of monitoring. In general noise surveys had only been carried out for environmental purposes, when there was a concern expressed by local residents about the noise levels at a site. Accident reporting was most often by completion of details in an accident book. A quarter of the companies had specific systems in place to investigate and report on accidents.

Accident data were rarely used to assess trends in accidents over time or in association with specific work groups or tasks. Similarly reporting of sickness absence data was patchy and when recorded tended to be in terms of numbers of days lost. There were no available data on the proportion of absence attributable to work-related factors. It was not common policy to undertake environmental monitoring.

Monitoring personal exposures can be difficult in the construction industry, due to the rapid completion or rescheduling of tasks, the 'sampling' environment and the need for informed consent from employees employed by a large number of different organisations. It could be helpful in the future to train employees in self-assessment and exposure monitoring.

Fewer hazardous substances were used on site than had been originally anticipated and this led to fewer opportunities to monitor exposures. However, a broad range of hazards was observed including physical, chemical and ergonomic hazards. Thirty five tasks were observed, and included painting using rollers, brushes and spraying; cutting or grinding tiles, or concrete slabs; cutting hardwood or medium density fibre board; and laying or sanding floors. Likely health hazards were identified. Respiratory and skin hazards predominated, followed by musculo-skeletal and ocular, with hand-arm and whole body vibration hazards and some noise. The most relevant potential health outcomes were dermatitis or skin irritation, asthmatic or bronchitic symptoms and irritation of nose and throat, followed by eye irritation, neck/shoulder, back or upper limb disorders, vibration white finger and hearing loss. Dust and paint were the most frequent hazardous substances. Physical hazards included manual handling and noise, vibration and ocular foreign bodies.

In general, there were no systems in place for reporting specific health concerns and no specific surveillance programmes to provide early identification of health problems associated with workplace exposures. Employees did not tend to make any association between possible occupational exposures and existing health problems.

The range and effectiveness of control measures observed were also variable. Whilst some companies had specific health related policies and procedures, of which employees reported being aware, there was variable compliance with these measures. PPE worn included respirators, and occasionally hearing protection, safety shoes, safety hat, goggles or overalls, Usually the individual decided what PPE was appropriate. Less often the manager decided.

The lack of knowledge about potential routes of exposure, and the nature of specific health hazards had an impact on the decision to wear PPE. Health surveillance when applied tended to be focused on specific groups rather than as part of a comprehensive programme covering the range of hazards present.

First Aiders were most commonly considered as the main source of advice on health issues within the workplace, although in general this tended to be in relation to accidents. A number of companies stated that they would refer employees to local GPs or request information from this source, but this

was not done on a formal basis. None of the companies visited had any formal occupational health provision.

The results of the study indicate that there are risks to health associated with the construction processes observed. Adverse health outcomes could be associated with respiratory, skin and ocular and musculo-skeletal hazards and as a result of exposure to noise and vibration. All of the sites visited had only limited controls in place in relation to the hazards observed, and the need for risk reduction measures was indicated in most cases. Whilst individuals observed during the study reported skin, respiratory and musculoskeletal conditions, they did not attribute these conditions to the work environment.

CONCLUSIONS

There is a need for consistent and simple systems to allow monitoring of data on work-related health within the construction industry. This study also highlights the need for further education initiatives on how health problems can arise from or be exacerbated by aspects of the construction process. Whilst companies are striving to achieve good practice in relation to safety at work, this is not yet true for health at work. In the main individuals were less confident about health-based knowledge, and how improving safety at work may also have beneficial impact for the health of employees.

There is a lack of baseline data on health within the industry, although systems exist that could be used for this purpose. It is suggested that a specific person is designated to this task at each site. They would require basic training in the completion of a simple health-based checklist, such as described in this report. Data should be collected for each construction process, in a consistent manner, and this information could be collated centrally to provide initial data on health trends within the industry. Specific tasks or employee groups could then be targeted for further follow-up.

It is considered that a simple audit tool based on a modified version of the COSHH essentials format could be introduced for specific aspects of the construction process, and could be incorporated into the final recording format to be used in the industry. However, it is not appropriate to apply COSHH Essentials in its current format in the construction industry, as it is not designed to consider the range of hazards that can be present at any one stage of the construction process. It is also difficult to quantify some of the hazards observed in terms of the parameters used in COSHH Essentials, and not always appropriate to categorise the hazards present on the basis of amount, level of dustiness and volatility.

All the companies visited had some form of safety induction that employees and increasingly subcontractors were required to attend. This opportunity could be used to obtain baseline data on health by simple questionnaire screening. Alternatively for subcontractors, this could be made a requirement of any pre-job agreement.

Most companies visited also hold toolbox talks. It would be useful to develop an approved programme of talks on relevant health issues within construction. There is also a need for those with responsibility for health and safety to have a better understanding of the role that control measures and PPE play in reducing specific risks to health.

Access to occupational health support is also limited. It would seem advisable to seek to establish a network of occupational health provision across the UK and to consider a 'smart card' system where data could be stored in a consistent manner and accessed by subsequent providers of occupational health support. The establishment of a database of local providers of services would also be helpful.

It is also necessary to take into account the variation in level of provision that would be required based on varying company size. Occupational health support should be equally accessible to full time employees and subcontractors, although the cost of service provision would have to be apportioned

appropriately. Willingness to share occupational health services may be central to the success of such provision in the construction industry.

Due to the lack of occupational health support, there are few systems in place for health surveillance of at risk groups and therefore no means of ensuring that occupational disease is identified at an early stage. Recommended surveillance schedules should be established as for other industries. It is also feasible to train individuals to be 'competent' in recognising early symptoms of certain conditions, such as dermatitis.

The results of this survey suggest that at present there appears to be limited knowledge about the potential impact of work on health within the construction industry. It appears that a simple system for mapping health hazards could provide useful data to target future resources. The impression gained from the site visits is that the construction industry is interested in the health of their work force. However, due to time constraints, and other competing priorities, health in the workplace is still low on their list of priorities.

1. INTRODUCTION

It is acknowledged that information on occupational health in the construction industry is at best sparse and scattered. The problems associated with a constantly changing work environment, potential exposure to a wide range of hazards and a relatively itinerant work force have hindered the process of mapping health outcome in relation to specific aspects of the construction process.

In a self-reported survey of work related illness (Osman et al, 1995) the construction industry was ranked second only to coal mining in terms of relative risk of work-related disease. Interestingly the authors also found that approximately fifty per cent of the cases reported in the survey took no sickness absence as a result of work-related illness. The common categories of illness reported within the construction industry include musculoskeletal disorders, dermatoses, lower respiratory disorders, and health effects of accidents. These effects are not restricted to the UK, with similar trends reported in the US and in Europe.

Arndt et al (1996) compared German construction workers in the 40-64 year age group with white-collar workers, and found a higher prevalence of musculoskeletal abnormalities, hearing loss, and obstructive lung disease. The results of a five-year follow up found that the increased rate of disability in the construction workers was causing them to leave the industry early. These findings were supported by Brenner and Ahern (2000) who found that 17% of employees taking ill-health retirement from construction work in Ireland were under 50 years of age, which accounted for 45% of potential working years lost.

General lifestyle factors such as smoking habit (Rothenbacher et al, 1998) and alcohol consumption (Mandell et al, 1992) have also been shown to have an impact on the health of construction workers, leading to disability and more frequent early ill-health retirement. This suggests the need to improve awareness of the health risk associated with smoking and excessive alcohol consumption, and of their role in exacerbating the potential effects of workplace exposures.

There have been a number of recent initiatives to improve occupational health risk management across the construction industry. The Health and Safety Commission launched the Working Well Together campaign in May 1999, in conjunction with the construction industry, to promote safer working practices. As part of this initiative a conference on 'Tackling health risks in construction' was held with construction stakeholders in October 2000, which sought to improve understanding of health risks within the industry and access to occupational health support.

This report considers a structured approach to mapping health hazards across the construction process, by the use of an audit-based approach. It was intended that the data collected would also allow an assessment of the feasibility of applying COSHH Essentials within the construction sector.

Warren *et al* (1995) reported that a hazard analysis approach encourages employee involvement in health and safety issues and provides a method of evaluating health and safety management programmes. Similarly Pilon *et al* (1990) showed that a risk appraisal process, combined with education initiatives on risk factors and risk reduction, could influence employee motivation to improve health status.

The COSHH Essentials scheme (HSE, 1999) for chemicals was developed by the HSE to assist small firms in making COSHH assessments. The scheme assigns the task being reviewed to one of four control approaches, taking account of how hazardous the substance is, how much is likely to become airborne to be inhaled, or come into contact with skin and eyes. Accompanying Control Guidance sheets provide practical advice for specific activities. The range of activities and substances encountered within the Construction Industry is much broader than so far applied to COSHH Essentials.

It was intended that the data collected from this study would assist the development of systems to enable the construction industry to effectively monitor and reduce work-related health risks.

2. OBJECTIVES

The aims of the study were as follows:

1. To map the health hazards and associated risks across the construction process.
2. To identify their origins and propose methods of effective control or elimination.
3. To assess the feasibility of applying a COSHH Essentials approach within the construction industry.
4. To develop an audit checklist which construction companies can use to assess their own performance.
5. To provide data which will inform HSE's own guidance to the construction industry.

3. METHODS

The study involved a cross-industry survey using an audit approach to map health hazards across specific aspects of the construction process. Companies were selected to represent the range of organisations undertaking construction work. The companies chosen ranged in size and also in the nature of the work routinely carried out.

3.1 SELECTION OF COMPANIES

Companies were selected from England and Scotland. Where feasible subcontractors were included in the audit process.

Companies were selected from available industry databases and IOM representatives attended a number of Construction Safety meetings where the nature of the project was discussed with company representatives. All companies indicating an interest were sent more information on the nature of the study and a consent form to agree participation in the survey. Each company who agreed to participate was contacted by the IOM Occupational Health Nurse who discussed with the company the specific background information that would be requested prior to the visit and the proposed format for the visits.

The IOM also presented a poster at the HSC Conference in October 2000 that highlighted the aims of the study.

In discussion with the sponsors it was agreed that an audit covering all aspects of the construction process would be too broad and would potentially limit the value of the data that could be collected within a given timescale. In order to realistically assess potential health hazards and data relevant to COSHH Essentials it was agreed to concentrate on the following:

- a. Preparation of external surfaces
- b. Finishing off of internal structures (to include internal surfaces and flooring but not fitting-out of other units or electricity and plumbing work)

It was also agreed that exposure data monitoring would be restricted to specific substances of interest rather than all substances used during a complete process.

3.2 DEVELOPMENT OF RECORDING FORMS

A multidisciplinary team of scientists and a physician using experience gained from previous work developed the audit tool. The team structure ensured that expertise was available on the range of health hazards expected throughout the construction process. Occupational hygiene input ensured that appropriate monitoring strategies were applied and supplementary data collected from on-site activities to meet the criteria of the COSHH Essentials scheme (HSE, 1999).

The COSHH Essentials scheme was developed by HSE to help small firms make COSHH Assessments for their activities. In its current format it is mainly relevant to handling raw chemicals as may occur in chemical and pharmaceutical manufacturing, the rubber and electroplating industries. The scheme assigns the task being assessed to one of four Control Approaches, taking account of: how hazardous the substance is, how much is likely to become airborne and be breathed in, or come into contact with the skin and eyes. Reference to a series of matrices allows the user to read off the Control Approach taking into account the amount of the substance being used and the level of dustiness or volatility. A number of Control Guidance Sheets accompany the COSHH Essentials document, which provide practical advice for specific activities within each of the four Control Approaches. The scheme also considers the type of harm that can occur to health systems in

association with use of the substance and the route of exposure, including irritancy, sensitisation, genetic damage and cancer.

The tool developed for use in this survey was designed to provide a framework for collecting information about health hazards associated with tasks within each construction process. Together with background data from the companies this information was collated to identify specific health hazards associated with each process. This information was then used to construct a simple checklist that could be used by the construction industries themselves to identify the occurrence and frequency of health problems within their own company.

The particular steps in the construction process under review were outlined. The potential hazards identified during observation of the task were noted, and the potential health outcomes associated with these hazards. The employee groups involved in the task were noted. Information was sought on the likely frequency of exposure to potential hazards associated with the task and the likely routes of exposure, for example skin, inhalation or ingestion.

These data were reviewed in relation to other observational data collected from the on-site visits. This gave an indication of the extent of compliance with existing policies and procedures, and gaps in current policy or procedures that could potentially be associated with adverse health outcome.

A risk rating process was devised during the development of the questionnaires. High risk was assumed where there was a high likelihood of harm occurring in association with the task, and where potential exposures were frequent or prolonged.

A 'residual risk' was assigned to each health outcome on the basis of the how well health hazards were controlled in practice, as follows:

Likelihood of adverse health outcome:

1. High
2. Medium
3. Low

Adequacy of existing control measures:

- A. Not controlled
- B. Partial control
- C. Satisfactory

A practice with a high risk of adverse health outcome for example where a respiratory sensitiser was used, where the risks were poorly controlled, for example inappropriate engineering controls or inadequate respiratory protection, would be assigned a high residual risk rating.

In general the risk ratings given in the summaries of the site visits (as highlighted in Appendix 2)) are based on risk associated with respiratory hazards, for which some quantitative sampling data were available. The 'risk rating' process also allowed some benchmarking between different sites, and allows companies to rate improvements in their own performance if repeating this procedure.

3.3 TRAINING OF PERSONNEL

The Senior OH Nurse attended an in-house IOM course on monitoring procedures for physical hazards that included practical instruction on the range of monitoring equipment that would be used on site. This included basic principles associated with the laboratory analytical process. Initial site visits including the pilot visit were supervised by a Senior Occupational Hygienist, who was able to give additional practical advice on appropriate monitoring strategy.

3.4 FORMAT OF THE SITE VISITS

A Senior Occupational Health Nurse made initial contact with the safety manager/officer for each company. They were sent details of the purpose and nature of the audit, and agreement was obtained from the company to conduct the audit at their site. The nurse was responsible for ensuring that relevant background data had been supplied by the participating companies and sent to the IOM, and she acted as the main point of contact for companies throughout the survey.

The timing of the visits was coordinated, as far as practical, to ensure that all main activities relevant to these tasks were available for observation. Employee feedback was sought only as part of the general observation of task activities and systems of work.

3.4.1 Background Data

The background data that was sought from the company prior to the visit included the total number of employees, both temporary/full time, and the number of contractors. The nature of the construction processes occurring on the site to be visited, and likely timescale to completion were also noted.

Details of the health and safety management structure were noted including the number of staff, the frequency of visits from trained Health and Safety staff to the site, and the range of expertise available. Information was sought on the existence of relevant health and safety policies and procedures and evidence of compliance with appropriate legislation. Information on risk assessment strategy was reviewed, and in particular any specific interventions that had arisen as a result of COSHH assessments. Safety Hazard Data was sought for all substances involved in the specific processes being reviewed, and any actual monitoring data that the company may have undertaken.

Information was sought on the extent of any environmental monitoring and any available exposure data. Employees were asked about the level of information and training they had received in relation to specific health hazards, and in controlling exposure to specific hazards. This information was confirmed with the site manager during the site visit. Information was also sought on current health surveillance initiatives.

Where sickness absence data was recorded, information was sought on how these data were used and whether any specific analysis of trends in absence had taken place. Similar information was sought on accident data, and in particular whether occupational disease were reported under RIDDOR, if applicable.

The level of occupational health support was also assessed based on the availability of a registered general nurse or an Occupational Health Nurse, or access to a local general practitioner or occupational physician. The number of trained First Aiders on site was also noted, and any specific training initiatives that were provided by the company relevant to occupational health and safety.

3.4.2 On Site Audit Process

The audit process considered the likely magnitude of risk based on a review of actual work practices at each of the sites visited. This was based on observation, monitoring where feasible, and discussion with management and employees on the sites.

At least one step in the construction processes outlined above was reviewed at each site. The main tasks associated with this process were identified. The main health hazards likely to be associated with these tasks were listed using a checklist approach, as highlighted in Appendix 1. This process also identified the likely groups of employees exposed, the potential routes of exposure and the associated health outcomes.

The Occupational Health Nurse assessed groups of employees in relation to the specific tasks identified. The nurse also verified the existence and frequency of training/education initiatives, and the content and coverage of such programmes.

This process aimed to allow potential health outcomes to be assigned to specific employee groups, and to facilitate the mapping of health hazards across those aspects of the construction process considered. It was considered that this would allow companies to direct resources to the areas with most health hazards.

The current systems of work were observed, and the range and effectiveness of any existing control measures. Control measures applied were categorised on the basis of natural ventilation, forced ventilation or PPE. Information on the type, usage, maintenance and storage of PPE was also sought. Progress with COSHH within the company was ascertained by discussion with health and safety personnel and review of relevant records.

In order to validate this data, a number of short-term samples were collected during the site visits, to assess potential exposure to a number of commonly used substances. Due to the relatively short time that the investigators were on site monitoring was limited to simple techniques, e.g. indicator tubes, passive badges, direct reading instruments. The results gave an indication of likely concentrations and hence exposure. In interpreting the results obtained, it is important to note that whilst some dust concentrations might seem high, the majority was within the Occupational Exposure Limit, and the operatives were often performing the tasks for periods up to an hour, rather than throughout a working day.

To aid the monitoring process participating companies were informed, prior to the visit, that samples would be collected, and permission sought to proceed with this. Wherever possible personal samples were taken, but where appropriate static or background samples were taken.

The nature of the substances to be sampled was determined by the appropriate sampling procedure. Measurements of dust concentrations were made using a direct reading DustTrak instrument. Monitoring procedures and sample analysis are described in Section 3.8.

It was anticipated that health surveillance data would be limited. However, where feasible the IOM Occupational Health Nurse liaised with occupational health professionals linked with each of the companies to assess level of service provision. It was agreed that anonymised data would be sought, where available, on the nature of any specific health surveillance programme, and trends identified. The survey also provided an opportunity to assess the general well being of employees, awareness of potential work-related health issues, and knowledge of reporting systems for those with relevant symptoms.

3.5 SUMMARY OF PILOT VISIT

The pilot visit took place on a site in Edinburgh, which was a refurbishment of a residential site. There were 6 full time employees on site and 30 subcontractors. There was a site manager who was full time on-site and a full time safety manager who visited each of the company sites on a monthly basis. There were no safety representatives on site.

There was a generic policy on site covering relevant health and safety legislation. Contractors were required to provide evidence of specific competences before being awarded a contract of work. The company was considering introducing specific requirements for the provision of health and safety information from contractors, and an additional question about the types of information requested from contractors was included.

COSHH assessment was based on a general assessment by substance groups and this had last been updated in 1990. It was stated that no toxic substances were used during the finishing processes,

although during the visit a toluene based adhesive, and an ammonia based emulsion were being used on site. There was no specific procedure for the use of personal protective equipment and this was said to be arranged on an 'ad-hoc' basis for each job.

An accident book was available for reporting accidents, but it was not clear whether there had been any recent RIDDOR reportable accidents. There was no system in place for recording sickness absence data, and no noise or environmental monitoring data were available. All employees attend an induction, and fortnightly toolbox talks were held, mostly on safety-based subjects. The employees did not have access to an occupational health provider, and there were no current health surveillance initiatives.

The pilot visit provided a useful insight into the nature of tasks and the timescales associated with the fitting out process within construction. It was clear that careful scheduling of visits would be essential. In some instances, tasks, which had been considered available for observation, had been completed earlier in the schedule or were delayed prior to other tasks being completed. It was also clear that it might be difficult to obtain appropriate samples on site, for these reasons, and that permission would need to be sought from sub-contractors, where sampling was required from their employees.

Minor modifications were made to the list of relevant policies and procedures that were to be requested at each site visit.

Although the audit form sought information on the provision of PPE, it was clear from the pilot visit that use of PPE was variable, and facilities for storage were limited. There was also limited provision of skin care facilities. These issues were therefore included in the updated version of the audit form.

The initial draft audit form had been based on the format used in COSHH Essentials, and had not separated out assessment of physical and chemical hazards. It was apparent from the pilot visit that a number of hazards could be associated with one task, for example respiratory, noise, hand-arm vibration and manual handling. For clarity of recording, it was decided to have separate recording sheets for physical and chemical hazards. . The original COSHH Essentials format also included quite detailed information for interpreting volatility of substances used and level of dustiness. It was noted at the pilot visit that volatility of substances was less of an issue as most products were used at room temperature, quantification of amount used was more difficult to establish due to the multiplicity of tasks in which the produce might be used and the relatively small quantities used for one task. Levels of dustiness were assessed by observation, with some supportive monitoring data. In general a less sophisticated range of control measures were used in practice, than documented in COSHH Essentials for the chemical industry.

3.6 DATA STORAGE AND CONFIDENTIALITY

Any sensitive data collected in the study has been anonymised. During the lifetime of the project any data on computer was kept on the IOM's network server in a directory to which only project members had access, protected by user-name and password. Standard procedures are in place to ensure the backup of the data, its off-site storage, and the protection of the server from computer viruses etc. At the end of the project the data will be removed from the server and held for ten years on electronic storage media (at least one copy of which will be secured off-site).

3.7 DATA ANALYSIS

Specific aspects of the data were analysed by the team member with relevant experience in that subject, and then the team reviewed the overall data in order to summarise findings and produce recommendations. The audit tool was also modified on the basis of these findings.

3.8 SAMPLE MONITORING AND ANALYSIS

3.8.1 Dust Monitoring

Personal Sampling

Samples to determine the concentration of inhalable dust in the operators breathing zone were collected in accordance with MDHS 14/3 (HSE, 2000). A weighed glass fibre filter held in an IOM sampling head was positioned in the operators breathing zone, i.e. 200-300mm from the mouth. Air was drawn through the filter at approximately 2.0 litre/min.

Due to the nature of the visits the sampling periods were relatively short i.e. approximately one hour. However, the samples were collected over representative periods of the work.

On completion of sampling the samples were returned to the IOM laboratory to be weighed. The inhalable dust concentration was then determined from the weight of dust collected and the known volume of the sample.

Background Measurements Using DustTrak

A TS1 DustTrak optical particle counter was used to give an indication of the general dust concentrations in the work area or in the vicinity of the operator during activities of short duration. The DustTrak averages the concentrations of dust of aerodynamic diameter of <10µm every minute. The measurements were used to give an indication of dust concentrations where it was not practical to use conventional pumped samples.

3.8.2 Solvent Monitoring

Samples to determine the airborne concentration of solvents were collected using 3M 3500 organic vapour monitors in accordance with MDHS 88. The monitors were placed within the breathing zone of the operator and samples collected over a representative period of the work activity.

On completion of sampling the monitors were returned to the IOM for analysis using a modification of MHHS 88 (HSE, 1997).

The samples were dissolved in 2mls of carbon disulphide. An aliquot of the sample was then analysed by gas chromatography (GC) with a flame ioniser detector. The GC was fitted with a 30m RH-UAX capillary column and programmed to heat from 40-175°C. Calibration standards were prepared from known weights of Analar grade chemicals in the description solution.

Wherever possible the samples were analysed to determine the concentrations of individual components. In the event of large numbers of constituent parts being present the samples were analysed for the main components.

4. SUMMARY OF FINDINGS

Detailed findings for each of the site visits can be found in Appendix 2. The following section summarises the main trends.

4.1 BACKGROUND DATA

The survey allowed a variety of processes to be considered across a wide geographical area. The survey included six companies from Scotland (three from the east and three from the west of Scotland) and six from England (three from the north, two from the Midlands and one from the south of England). The range of construction processes covered included four new commercial construction projects, three residential and two public sector new projects. The other three projects reviewed were refurbishment of one public sector and two private sector buildings.

All the companies approached were keen to take part in this project. However, organising the visits, finding a site at the right stage of the construction process, and the availability of someone to go around the site and answer relevant questions proved to be more time consuming than initially anticipated. During the site visits it was found that the project generated interest, not only amongst health and safety personnel, but also from individual workers especially in the younger age groups. People were prepared to spend time to answer questions about the work and the organisation. Tours of the site and subsequent monitoring were accepted with good humour.

The information obtained included categorical or quantitative data, and much descriptive information, summarised below.

Table 1
Number of Employees

Company	Full Time	Part Time	Contractors	Sub contractors
1	15	*		13
2	70			69
3	200		3	197
4	49		300	30
5	20			10
6	120	1	10	104
7	8		3	27
8	10			100
9	3		14	40
10	10			60
11	4	1		30
12	3	1		35

* Blanks are zero

The sites varied in terms of the number of full time staff and the number of subcontractors. Table 1 shows that the number of staff on site ranged from 3 to 200 full time staff, and from 14 contractors to more than 300 subcontractors. Since most of the larger sites had few actual employees on site, in order to take samples, permission had to be sought from the other companies. As a representative was often not on site, individuals were sometimes reluctant to take part without their company being informed.

4.1.1 Current Health and Safety Policy

All 12 companies had health and safety policies in place and documented. However the frequencies at which these were revised was variable, and in practice they were not used as an active source of information. Three quarters (8) of the companies made these documents available to sub-contractors. Eleven companies had some form of pre-contractual assessment of subcontractors, but policies on pre-contract agreements varied, with some companies requiring specific proof of competences, and health and safety procedures to be applied to the job. However, in some instances the start-up information required of contractors was negligible. Two companies collected pre-employment information about medical conditions and this information was retained by the site manager or sent to the head office. There was no clear indication of what was or should be done with this information.

Sites also varied in relation to the level of health and safety expertise that was available on site. All companies had some form of health and safety staffing. All but one had a full time Safety Manager (not permanently on site), and one company reported having five full time staff in this role. In the main Safety Managers visited sites on a cyclical basis, often monthly. Only two companies had a health and safety officer on site, and only four had a health and safety representative on site. Two sites reported having a site-specific project manager, with responsibility for health and safety. Apart from this, responsibility for health and safety implicitly rested with line management on site.

In general, although there were differences in the level and provision of safety management systems across the companies visited, there was little current emphasis on health-based problems within the workplace. Understanding also appeared to be limited among employees working of the nature of possible occupational health problems that might be associated with the tasks they were undertaking

4.2 TRENDS IN DATA COLLECTION AND REPORTING

All the companies provided safety data sheets. Limited airborne monitoring data were available at only four of the companies and it was not common policy to undertake this type of monitoring. In general noise surveys (eight companies) had only been carried out for environmental purposes, when there was a concern expressed by local residents about the noise levels at a site.

Accident reporting was most often by completion of details in an accident book. A quarter of the companies had specific systems in place to investigate and report on accidents. Accident data were used in five companies to assess trends in accidents over time or in association with specific work groups or tasks. This information was not available in the others, although site-specific information was often reported back to the sites on an annual basis.

Whilst it was common to find systems in place for accident reporting, including reporting of injuries under RIDDOR (1995), the requirement for reporting of specific health outcomes under RIDDOR was not generally in place. In general this was also true for recording of sickness absence. Even where records were kept these were often held at a head office, and the local sites were often not aware of any particular trend in absence over time or for specific occupational groups.

Similarly, reporting of sickness absence data was patchy (only 5 companies) and when recorded tended to be in terms of numbers of days lost rather than rates or episodes. Data were often forwarded to a head office, and were often not communicated to the site. A minority of the companies visited suggested that trends in absence across groups or across sites were evaluated. Four companies provided rates over the last 12 months. One company had been using data recorded on medical certificates to highlight potential work-related conditions for further follow up. No data were available on the proportion of absence attributable to work-related factors, or on trends over longer than 12 months.

4.3 EXPOSURES

In general, fewer hazardous substances were used on site than had been originally anticipated and this led to fewer opportunities to monitor exposures. More water-based rather than solvent-based products were used, and there was limited use of epoxy-based resins or adhesives. However, a broad range of hazards was observed including physical, chemical and ergonomic hazards. In addition to reluctance on the part of some subcontractors to be involved in a monitoring process, rescheduling of activities often meant that tasks had been completed prior to the site visit. On occasions, where monitoring was established, the employees moved to another area of the site and it was not possible to locate them during the visit to retrieve the personal samplers.

Table 2
35 Tasks observed

Main Task	Materials and subsidiary tasks
Cutting	Stone slabs (c3), concrete slabs (c4), hardwood, (c1), core board (c7), chipboard (c12), compressed board (c12), tiles (c6)
Grinding/sanding	Tiles (c2), sanding/screeding floor (c9,c11)
Painting, coating, sealing, soldering	Paint prying (c3, c6) Paint brush (c4), roller (c8, c10, c11) Coating tiles, with mop (c6) Soldering joints (c9)
Fitting out	Applying silicone bathroom sealant (c12) Laying flooring (c8), tiling, (c12) Electrics (c11), bolting (c7) Fitting boards and wall units (C6, c8)
Cleaning	General (c3, c6, c7, c8) Removing sandstone with hammer and chisel (c10)
Firming base	Thumper operation (c4)
Transport	Fork lift truck driving (c11)

c=company

4.3.1 Summary of Health Hazard Audit Form Data

All the sites were visited at the finishing off and fitting out stage. The tasks commonly observed are shown in Table 2, and included; painting, using rollers, brushes and spraying; cutting or grinding tiles, or concrete slabs; cutting hardwood or medium density fibre board; and laying or sanding floors. The forms were mostly adequately completed, though a few sections were missing. Table 3 shows the main health hazards. Respiratory and skin hazards predominate, followed by musculo-skeletal and ocular, with hand-arm and whole body vibration hazards and some noise.

Table 3
Numbers of tasks according to health hazards and employee groups

	Resp-iratory	Skin	Musculo-skeletal	Ocular	Hand Arm Vibration	Noise	Whole Body vibration	Stress/ Psychological
Labourers	13	12	3	4	1	1		
Painters	6	6	1	2				
Tilers	4	4	1	1				
Joiners	3	4			2	1		
Fitters (board)	1	1	1					
Floor layers	4	4	3	1	1	3	1	
Stone masons	1	1						
Electrician	1	1	1					
Plumber	1							
Forklift truck driver	1	1		1			1	
Supervisors	1	1	1					
All	36	35	11	9	4	4	2	0

The main routes of exposure were skin, inhalation and ingestion.

Table 4 shows that the most relevant potential health outcomes were dermatitis or skin irritation, asthmatic, bronchitic symptoms and irritation of nose and throat, followed by eye irritation, neck/shoulder, back or upper limb disorders, and hearing loss. Dust and paint were the most frequent hazardous substances (Table 10). Physical hazards, based on only 19 reports, included manual handling and noise (6 each), vibration (5), and ocular (2). Equipment in use (from 13 reports) included various powered saws, a handsaw, drill, brush, sander, hammer, chisel industrial vacuum, and a thumper. Equipment control measures, based on 12 reports, included PPE (4), engineering controls (3), shielding/damping (2), information/training (2) and maintenance of equipment (1).

Manual handling loads were reported to be 2.3 kg, 10kg, 12.5 kg, 50 kg and unknown. Frequencies of manual handling varied widely according to the needs of the job

Table 4
Potential health outcomes and hazardous agents

Relevant potential health outcomes (35 tasks recorded)	Substances with potential health hazards (33 tasks)
Irritation to nose/throat	Dust 17
Asthmatic/wheeze/bronchitic symptoms	Paint 7
Dermatitis/skin irritation	Lithufin 1
Eye irritation	Epoxy resin 1
Neck/shoulder disorder	Forbo screed master 1
Back disorder	Solder flux 1
Upper limb disorder	Gyvlon Slurry abrasive 1
Hearing loss	Adhesive 2
Lower limb disorder	Silicone sealant 1
	Chipboard 1

Table 5 shows that the most common control measures were natural ventilation and personal protective equipment, with some information/training and engineering controls.

Table 5
Control measures

Control measures in place (31 tasks recorded)	
Natural ventilation	27
Personal protective equipment	18
Information/training	7
Engineering controls	5
Forced ventilation	1
Health surveillance	1
	0

Of 27 responses, 12 said they were aware of the health risks associated with the task. Data sheets were available for 8 (of 21 reports).

PPE worn included respirators, (10), hearing protection (2), safety shoes, (4), safety hat (1), goggles (1), overalls (2), none (4). In 18 out of 26 responses, the individual decided what PPE was appropriate.

Five of 27 individuals reported health problems, of which only one (skin irritation) was thought to be work-related.

4.3.2 Supporting Observations

At one of the sites sandstone was being removed and at this site operatives wore appropriate respiratory protective equipment and followed a safe system of work. In general the processes observed at the sites visited were not associated with potential exposures to respirable silica.

Cutting of wood or boarding was generally associated with less stringent control measures and high dust levels were noted in association with these tasks from DustTrak and personal monitors.

Water-based paints were more commonly used than had been anticipated prior to the visits. In circumstances where solvent-based paints were used, and where monitoring was feasible, Occupational Exposure Limits (OELs) were not exceeded for the tasks observed. However, painting often occurred in relatively confined spaces and operatives generally relied on natural ventilation as the main control measure. As some of the solvent-based paints contained toluene, xylene and benzene products, it is apparent that safer systems of work are appropriate. The drying and defatting effect of these substances is also noted in the Material Safety Data Sheets provided but this was not taken into account in practice in relation to skin exposure.

Material Safety Data Sheet information emphasised the need for adequate ventilation and additional extraction when using these products. The potential for skin and eye irritation was also noted but appropriate control measures were generally not evident. Nine of the sites reported that they had introduced specific initiatives as a result of the C.O.S.H.H assessments.

Epoxy-based adhesives were only being used at two of the sites visited, although in both instances, there was a lack of adequate control measures to prevent potential skin sensitisation. The adhesive and resin-based products observed were more commonly vinyl acetate or polyester based.

With the exception of a few activities monitored, the nature of the environment in which tasks were observed suggested that the general level of natural ventilation existing at the time of the visit was satisfactory. However, it is not appropriate to rely on this control measure without supportive information from actual exposure monitoring.

For those tasks where control was less than satisfactory there were specific contributory factors. Dust levels at Company 10 were associated with a task performed in a basement area without adequate ventilation. Similarly, at Company 7 the effectiveness of the enclosure used was questionable and there was no additional source of extraction. The use of an antibloom agent at Company 3 in a relatively confined space generated high levels of toluene.

4.3.3. Monitoring Data

Tables 6a and 6b provide summaries of the monitoring data obtained from the site visits. As anticipated dust and solvent exposure were the most common substances present for which monitoring was appropriate. Dust levels were high, very high for some tasks. Most tasks were of relatively short duration. Information was not obtained on whether the individuals conducted these tasks throughout the shift. Presumably this would be more likely for individuals with specialist skills. The results highlight that these exposures can arise from a number of tasks, and performance of a similar task can be associated with a range of exposures. Exposures to solvents tended to be within the OELs. Control measures for both solvent and dust exposure were variable across the sites.

Table 6a
Sampling results by type of task; dust exposure

TASK	Sampling time (min)	Dust concentration Mg/m ³	RPE WORN
Cutting compressed boards	30	3.9	No
	45	5.3	3M particulate respirator/ear plugs
Laying ceramic tiles	50	7.6	No
Cutting core boards	50	44.9	Disposable mask
	30	97.9	
Fitting MDF Units	40	0.3	No
Cutting concrete	30	4.2	No
Cleaning Site	30	8.3	No
Removal Sandstone			Respirators
	45	49.0	Hearing defenders
Screed Cutting			Gloves (B&Q cloth)
	45	4.9	No

Note: OELs; general dust 10 mg⁻³ total, 4 mg⁻³ respirable (LTEL); wood dust (hard or soft) 5 mg⁻³ LTEL (MEL); respirable silica 0.3 mg⁻³ (LTEL) MEL. Insufficient information was available for the estimation of protection factors.

Table 6b
Solvent exposure

	Exposure Time	Toluene (ppm)	Benzene (ppm)	Xylene (ppm)	PPE Worn
Spray Painting	20 mins	12.9			Coveralls
	55 mins	0.4		0.2	Respirator
	45 mins	<1			
Painting	45 mins	<1	<1		Disposable
	65 mins	2	<1	3	Masks
	50 mins	0.8		1.2	
Wood staining	30 mins	1.8		18.1	Coverall
Occupational exposure limits at March 2002		OES 50 (STEL) 150 (LTEL) Sk*	3 8hr TWA (MEL)	OES 50 (STEL) 100 (LTEL) Sk*	

*Skin irritant or sensitiser

Employees did not tend to make any association between possible occupational exposures and existing health problems. In general systems in place for reporting specific health concerns were not in place, and there were no specific surveillance programmes to provide early identification of health problems associated with workplace exposures. Only two of the companies had any formal pre-employment assessment, which could act as baseline information against which to measure future changes in health status.

4.4 TRAINING

Training initiatives were mostly safety-based. Induction to sites varied from a full induction session to none at all, although all the sites did state that they carried out induction for all new people as and when they came on site. In some cases this involved inducting several people every day. Induction varied from a general overview of site safety to one that gave a health awareness talk about skin care.

Although most of the companies interviewed provided regular toolbox talks, the frequency with which these occurred was variable. Toolbox talks were generally task safety orientated and although Safety Advisers were keen to discuss health issues, they felt they did not have the knowledge required. One Health and Safety Adviser said that they had tried to locate a training course that would provide an overview of what was required to set up a health surveillance programme and that the courses located required a nursing or medical background. However, as projects got nearer completion the toolbox talks were reduced because of time constraints. What were in some cases weekly or monthly inputs stopped completely.

Some companies had introduced basic training in manual handling and some were making better skin care provision available. However, for this to be effective it must also be associated with health education of the workforce so that they understand the reason for such provision and to use it regularly and appropriately.

The level of training and experience of staff responsible for a safety remit varied between the companies, often dependent on company size. Safety managers commonly had responsibility for wide geographical areas and tended to visit any one site on an infrequent basis. The level of training and refresher updates provided by companies also differed, and was mostly focused on safety-based training although some three companies had considered manual handling requirements and the need for a drugs/alcohol policy. In four of the companies visited training programmes were only available to specific grades of staff.

4.5 CONTROL MEASURES

The range and effectiveness of control measures observed were also variable. Whilst some companies had specific health related policies and procedures, of which employees reported being aware, there was variable compliance with these measures. In several cases the practice carried out was based on a subjective assessment of the risk by the individual concerned. Individuals also reported using risk reduction strategies, derived from their own perceptions of the risk associated with specific processes.

Whilst most employees were aware that information on the potential health hazards of substances could be found from Material Safety Data Sheets (MSDS), it was apparent that the information provided was not adhered to in practice. In the main these information sheets were available on request and stored at the site office, although some had to be requested. In reviewing the control measures recommended within these documents, it was clear that there was variable compliance in practice.

The lack of knowledge about potential routes of exposure, and the nature of specific health hazards had an impact on the decision to wear PPE. A number of employees reported that they had been advised by their employer of the necessity of wearing PPE. However, in those circumstances where the employees chose not to wear PPE it was apparent that no enforcement was applied. Many operatives cited their decision for not wearing appropriate PPE as being due to the limited risk that they associated with a particular task.

There were also practical problems in companies maintaining regular inventories of PPE issue, and tracking this on a regular basis. This has implications for the effectiveness of the PPE in actual use. Operatives cited reasons for deciding to use respiratory protective equipment (RPE), such as ‘when the smell gets too bad’. Some chose other methods for dealing with the potential effects of workplace exposures, such as drinking milk to remove the taste of solvents after painting and physically removing themselves from the work environment ‘to get some fresh air’.

There was little evidence to suggest that COSHH assessments had led to specific improvements in work practice and often this was seen as a paper exercise. Accordingly there was little awareness of adverse health outcomes that might be associated with poor control measures and the criteria for health surveillance based on the COSHH regulations were mostly not applied.

There was occasional evidence from specific subcontractor groups that health surveillance had been considered for specific hazards but this was often due to heightened publicity about a particular health outcome. Health surveillance when applied tended to be focused on specific groups rather than as part of a comprehensive programme covering the range of hazards present. There was no evidence to suggest that a health needs assessment had been carried out to determine the range of surveillance required or the groups to be included in the surveillance process.

4.6 WORKPLACE HEALTH PROVISION

First Aiders were most commonly considered as the main source of advice on health issues within the workplace, although in general this tended to be in relation to accidents. A number of companies stated that they would refer employees to local GPs or request information from this source, but this was not done on a formal basis. None of the companies visited had any formal occupational health provision, although one company did provide access to private health care for certain groups of employees, and this included a general screening medical for staff above a certain grade. In general there was limited knowledge of availability of occupational health provision, or of the health-based needs within the company.

Recent research by the IOM (in press) suggests that companies are generally not keen to share occupational health provision, and therefore in planning for future provision it is important to have a system which is flexible for the needs of the workforce, and can provide ready access to local

services, but also provides consistency of recording for companies located across wide geographical areas.

During the visits several cases of occupational dermatitis were observed. One individual related his dermatitis to working with cement. His work now did not involve using cement and this had been a conscious decision on his part.

Whilst previous research suggests that occupational dermatoses are the most common occupational disease within the construction industry, there was no consistent programme of skin care provision within the companies visited. Whilst some companies had taken steps to ensure that appropriate cleansing products and moisturising products were available, in others, provision of cleansing agents was limited to Swarfega, or proprietary agents such as 'Mr Muscle'. There was also evidence that employees did not follow the recommended skin care regimes that were in place. The majority of the sites visited had provision of basic hygiene facilities and therefore it should be feasible to introduce appropriate measures with education initiatives to improve skin care.

Whilst previously published data (e.g. Arndt et al, 1996) suggests work in construction is associated with a number of adverse health outcomes and will involve higher rates of early ill-health retirement, the majority of employees interviewed during the survey did not report adverse health outcomes in association with work. However, in the main, employees were not aware of adverse health outcomes that might be associated with a specific task or exposure. This suggests a need for better health education in relation to workplace health, which should also include the association between smoking and alcohol consumption and specific occupational exposures.

Several people indicated that they had asthma and tended to increase the use of their inhaler if they experienced symptoms at work. Few wore dust masks, and if they did, they reported finding them uncomfortable and only wore them for short periods. The older workers were keen to explain that they had worked in the industry for 20 – 30 years and had no problems.

The results of the study suggest that there are risks to health associated with the construction processes observed. Potential health effects could be associated with respiratory, skin and ocular and musculo-skeletal hazards and as a result of exposure to noise and vibration.

All of the sites visited had only limited controls in place in relation to the hazards observed, and improved risk reduction measures were appropriate in most cases, as highlighted in Appendix 2. Whilst individuals observed during the study reported skin, respiratory and musculo-skeletal conditions, they did not attribute these conditions to the work environment. Stress or mental health conditions were also not reported by the employees observed during the site visits.

There are practical difficulties associated with collection of data on health in the construction industry. The composition of the workforce is often changing and may include several ethnic groups with differing language needs and with differing cultural concepts of health and its relation to work. Staff on site reported difficulty meeting the requirements of other reporting schemes, such as RIDDOR, or tracking systems such as use of PPE. Monitoring personal exposures can also be difficult due to the rapid completion or rescheduling of tasks, the 'sampling' environment and the need to potentially obtain consent from a large number of subcontractors to carry out sampling.

There is clearly a need for consistent and simple systems to allow monitoring of data on work-related health within the construction industry. The impression gained from the site visits is that the construction industry is interested in the health of their work force and health surveillance programmes. However, as many of the projects have time constraints it is still low on their list of priorities.

5. CONCLUSION

At present there are no consistent systems in place for tracking data on health problems within the construction industry. This study also highlights the need for further education initiatives on how health problems can arise from or be exacerbated by aspects of the construction process. A knowledge gap also exists between application of good practice in relation to safety and health, in particular understanding the relationship between these two factors.

There are clearly obstacles to be overcome in order to implement a system for collecting health data in a comprehensive and consistent manner within the construction industry. The nature of the work means that employees change locations and employers on a regular basis, and proportionately there are far more subcontractors than full-time staff on a site at any time. There are logistical problems relating to the size and layout of sites and in meeting the needs of employee groups whose first language is not English.

5.1 DATA COLLECTION SYSTEMS

In order to establish an effective system for collecting data on health within construction, it is important to consider the existing level of knowledge on health issues, and the level of compliance with existing reporting systems. The COSHH Essentials format as developed for the chemical industry is not appropriate for the construction industry, but provides a useful basis on which to devise a system for the construction industry.

It is considered preferable to start with a simple recording system which is easy to use and access, aiming to develop a more detailed system in due course, accompanied by specific training and information packages developed for managers and employees. There do already exist systems in place that could be used to facilitate this process, such as the Working Backs initiative (HEBS and HSE, 2000).

A proposed recording form is included in Appendix 3 with associated guidance on completion. It is suggested that a designated person be assigned the task of completing record forms for each construction process and that this information could be collated at a central point to provide initial data on health trends within the industry. Specific tasks or employee groups could then be targeted for further follow-up.

All the companies visited had some form of safety induction that employees were required to attend and increasingly subcontractors were also required to attend. This opportunity could be used to obtain baseline data on health by simple questionnaire screening. Alternatively for subcontractors, this could be made a requirement of any pre-job agreement.

The CDM Regulations (1994) include a specific requirement for the production of a health and safety plan, and similar requirements could be developed for tracking health issues. At the present time the reporting of occupational disease under RIDDOR is not a frequent occurrence in the construction industry, based on the results of this survey. Therefore a review of the reporting process would be recommended in order to improve future rates of reporting, or to utilise this system to provide more reliable data on work-related ill health.

Reducing accidents within construction has been seen as a major priority in recent years, and there was evidence from the companies visited of reporting procedures for accidents but with little evaluation of trends in reporting. Again further education on investigation of incidents as a means of improving the future safety profile seems essential.

Whilst several published studies confirm high levels of ill health associated with work in the construction industry, Brenner and Ahern (2000) found an under-reporting of the true levels of incapacity arising from work-related illness in the construction industry. This study suggests similar findings, in that individuals did not tend to attribute ill health to work related factors. This may be due to a lack of reporting systems, or a tendency to attribute illness to other factors, or a determination to work on regardless of health concerns. The findings of this survey suggest that even where data on absence was collected, this was often in terms of days lost and this data was passed onto the head office and not reviewed or evaluated at site level. It would be valuable to review data on trends in absence reporting which was not commonly reported in this survey. One company was using data recorded on medical certificates to highlight possible work-related conditions. It is necessary to have appropriate recording systems in place in order to develop this process further.

5.2 TRAINING INITIATIVES

Toolbox talks are also held by most companies visited but with a variable frequency. It would be useful to seek to develop a recommended programme of talks on relevant health issues within construction, which could be provided at a limited cost or made available on the Internet. These topics could also include general lifestyle factors and should accommodate differing language needs.

There are also opportunities for using COSHH assessments as a training exercise to highlight the association between safety and health, and to ensure COSHH is not merely a paper exercise. There is also a clear need for Supervisors and Safety Representatives to have a better understanding of the role that control measures and PPE play in reducing specific risks to health.

Such a programme of health education could be supplemented with a phone line that provides additional support to construction companies on health issues arising within construction.

In view of the difficulty of sampling the exposures of highly mobile employees, there might be benefit in training some of them in simple sampling techniques.

5.3 OCCUPATIONAL HEALTH SUPPORT

Access to occupational health support is also limited, which again may result in an underestimation of the impact of work in construction and health. Many itinerant working groups are often not registered with a general practitioner. It would seem advisable to establish a network of occupational health provision across the UK and to consider a 'smart card' system where data could be stored in a consistent manner and accessed by subsequent providers of occupational health support.

It is also necessary to take into account the variation in level of provision that would be required based on varying company size. Occupational health support should be equally accessible to full time employees and subcontractors, although the cost of service provision would have to be apportioned appropriately. Willingness to share occupational health services may be central to the success of such provision in the construction industry.

Due to the lack of occupational health support, there are few systems in place for health surveillance of at risk groups and therefore no means of ensuring that occupational disease is identified at an early stage. Recommended surveillance schedules should be established as for other industries.

It is feasible to train individuals to be 'competent' to recognise early symptoms of certain conditions, such as dermatitis, and some companies were extending the role of the First Aider in this way. A specific training programme could be developed to assist lay people in becoming competent in the recognition of early signs or symptoms of work related disease, as a first step to improving the surveillance and detection of these conditions.

5.4 FEASIBILITY OF COSHH ESSENTIALS IN CONSTRUCTION

The survey demonstrates that the potential range of hazards that can be associated with a single task in the construction industry is broader than the chemical industry for which the COSHH Essentials system was originally devised. Therefore the COSHH Essentials system whilst providing a useful template would have to be modified and in some areas simplified to be of benefit in the construction industry.

There is a need to consider the range of physical, chemical, biological and psychosocial hazards within the construction industry. Due to the complexity of the process, it is also important to consider groups of tasks within each stage of the construction process. It is also difficult to quantify some of the hazards such as musculo-skeletal or vibration hazards in terms of the parameters used in COSHH Essentials, and it is not always appropriate to categorise the hazards present on the basis of amount, level of dustiness and volatility. At the current time the range of control measures used is often less wide-ranging than detailed in COSHH Essentials.

The survey also highlighted the practical difficulties of arranging and taking samples on site and the need to gain agreement with subcontractors for any sampling programme. However, it is considered that a simplified and modified version of the COSHH Essentials format could be introduced for specific aspects of the construction process. Further details are given in Appendix 3.

The results of this survey suggest that at present there appears to be limited knowledge about the potential impact of work on health within the construction industry, and it appears that a simple system for mapping health hazards could provide useful data to target future resources.

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APPENDIX 1

BACKGROUND COMPANY DATA

(1) Name and Address of Company:

.....

.....

Possible location of site for visit

Contact details at site/tel no. :

.....

(2) Number of Employees: F/T

P/T

Contractors

Subcontractors

(3) Construction Process: (i) External Surfaces

(ii) Fitting Out

Type of task

Timescale

(4) Current Health and Safety Policy Y / N

Copy Available Y / N

Contractors copy available Y/N

Contractors pre-job questionnaire/interview Y/N

(5) Safety Management Structure Nos:

Full Time Safety Manager

P/T Safety Manager

H&S Officer

H&S Representatives

Communication of health and safety information to employees

- (6) Trained First Aiders
- (7) (a) Occupational Physician - F/T Y / N
- Sessional Y / N
(b) GP Y / N
(c) Occupational Health Nurse - F/T Y / N
- P/T Y / N

(for a-c: Specify numbers of sessions/ relevant professional qualifications)

- (8) Are policies and procedures available for the following?
- | | | |
|---------|--------------------------------|-------|
| (i) | COSHH | Y / N |
| (ii) | Manual Handling Regs | Y / N |
| (iii) | Construction H&S& Welfare Regs | Y / N |
| (iv) | First Aid at Work Regs | Y / N |
| (v) | Emergency Procedures | Y / N |
| (vi) | Noise at Work Regs | Y / N |
| (vii) | Control of Asbestos Regs | Y / N |
| (viii) | Accidents | Y / N |
| (ix) | Industrial Diseases [RIDDOR] | Y / N |
| (x) | Management Regs | Y / N |

- (9) Are the following data available for review?
- (i) Safety Hazard Data Sheets
(for substances used on site) Y / N

- (ii) Airborne Monitoring Data
 - (Occ.Hygiene Data) Y / N
- (iii) Noise Surveys Y / N
- (iv) Accident Data - incidents over last 12 months Y / N
 - trends over last 3 years Y / N
- (v) Sickness Absence data
 - rates over last 12 months Y / N
 - trends over last 3 years Y / N

- 10) (a) Specify initiatives introduced to address workplace hazards as a result of COSHH assessments

- (b) Specify types of PPE used, maintenance and storage facilities

(c) Specify current training initiatives relevant to Occupational Health and Safety

--

(d) Specify nature and frequency of health surveillance activities

--

Provisional date for visit:

MAPPING HEALTH HAZARDS AND RISKS ACROSS ASPECTS OF THE CONSTRUCTION PROCESS

Company Name:

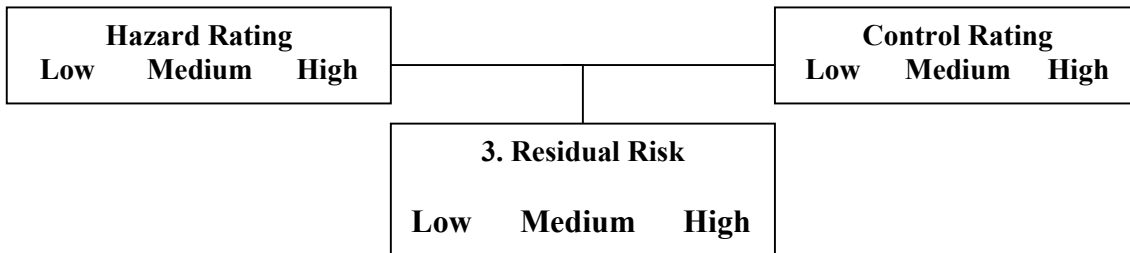
Date:

Site:

Description of task:

Chemical Hazards

<p>1a. Main Health Hazards:</p> <p>1b. Groups at risk: (Note main employee group)</p> <p>1c. Routes of exposure: Skin Inhalation Ingestion</p> <p>1d. Likely health outcomes:</p>	<p>2a. Substances in use:</p> <p>2b. Amount: Small Medium Large</p> <p>2c. Dusty (solids) Low Medium High</p> <p>Liquids (Volatility) Low Medium High</p> <p>2d. Control measures</p> <ul style="list-style-type: none"> a. Natural ventilation b. Forced ventilation c. Engineering control d. P.P.E. e. Information/training f. Health surveillance
--	---



4. Prioritise Action	Action:
	1.
	2.
	3.
	4.
	5.
	6.

Review Date:

Signature:

MAPPING HEALTH HAZARDS AND RISKS ACROSS ASPECTS OF THE CONSTRUCTION PROCESS

Company Name:

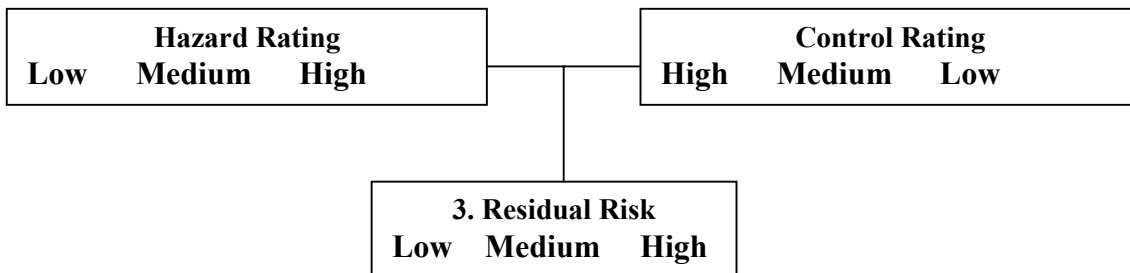
Date:

Site:

Description of task:

Physical Hazards

<p>1a. Main Health Hazards:</p> <p>1b. Groups at risk: (Note main employee group)</p> <p>1c. Routes of exposure: Vibration Noise Ocular</p> <p>1d. Likely health outcomes:</p>	<p>2a. Equipment in use:</p> <p>2b. Load</p> <p>2c. Duration Frequency</p> <p>2d. Control measures</p> <p style="margin-left: 20px;">a. Natural ventilation b. Forced ventilation c. Engineering control d. P.P.E. e. Information/training f. Health surveillance</p>
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<p>4. Prioritise Action</p>	<p>Action:</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6.
------------------------------------	---

Review Date:

Signature:

Protocol for Completion of Health Hazards Audit Form

Complete NAME OF COMPANY visited and MAIN TASK OBSERVED (i.e. which aspect of preparation of external surfaces or fitting out)

1a Note main health hazards associated with the task

- | | |
|---------------------------|----------------------------|
| (i) Skin | (vi) Noise |
| (ii) Respiratory | (vii) Ocular |
| (iii) Musculo-skeletal | (viii) Stress/psychosocial |
| (iv) Whole body vibration | (x) Other (specify) |
| (v) Hand arm vibration | |

1b Note main employee groups at risk

- | | |
|--------------------|----------------------|
| (i) Painters | (vi) Supervisors |
| (ii) Joiners | (vii) Plumbers |
| (iii) Electricians | (viii) Plasterers |
| (iv) Fitters | (ix) Other (specify) |
| (v) Labourers | |

1c Where applicable, note main route of exposure for hazards listed in 1(a)

1d Note likely health outcomes for hazards listed in 1(a)

- | | | |
|---------------------------------|------------|---------------------------------|
| (i) dermatitis/skin irritation | | |
| (ii) asthma/wheeze | | |
| (iii) irritation to nose/throat | | |
| (iv) neck/shoulder disorder | - joint | |
| | - muscular | |
| (v) upper limb disorder | - joint | |
| | - muscular | |
| (vi) back | - joint | |
| | - muscular | |
| (vii) lower limb | - joint | |
| | - muscular | |
| (viii) hearing loss | | (xi) gastric upset |
| (ix) eye irritation | | (xii) cancer |
| (x) burns | | (xiii) cardiovascular disease |
| | | (xiv) stress/anxiety/depression |

2a Note the names of the substance(s) which relate to health hazard(s) listed in 1a

2b Note the amount of substance used:

small	eg. <500g, 0.5l
medium	eg. 500g to 50kg or 50l
large	eg. >50kg

2c For solids note degree of dustiness:

low	- pellet-like with little dust
medium	- granular, dust settles on surfaces
high	- fine light powders, dust clouds remain airborne several minutes

For liquids note volatility (may need access to Material Safety Data Sheet)

low	- boiling point > 150°C for tasks carried out at room temperature
medium	- BP between 50-150°C for tasks carried out at room temperature
high	- boiling point <50°C for tasks carried out at room temperature

2d Note the control measures which are currently in place from those listed on questionnaire

2e Assess the current level of control given the effectiveness of the measures listed in 2d

3. Considering the effectiveness of the current controls (2e) and the potential health hazard (1e), rate the residual risk as low/medium/high

e.g. if potential health hazard high and current controls low, residual risk is high
if potential health hazard medium and control medium (or high) residual risk is low

4. In discussion with colleagues with relevant knowledge of hazards and controls, list actions to be taken in order of priority to reduce residual risk as far as reasonably practical.

APPENDIX 2

COMPANY ONE

Company size/location: 150 full time employees
20 Subcontractors (variable)
East Scotland (Dundee)

Nature of Construction Process: All aspects
Completion of commercial site
New building

Safety Management Structure:

There was a site manager and full time safety manager. There was a generic company health and safety policy, with policies and procedures covering the range of relevant health and safety legislation. There was a variable requirement for provision of safety policy data from subcontractors.

Health and Safety Data:

Safety Hazard Data sheets were available for the substances used. Noise and environmental monitoring had taken place for specific tasks. Environmental surveys have led to modifications in work practices (upgrading LEV and review of Personal Protective Equipment).

Accidents were recorded in the accident book, although no RIDDOR reportable accidents had occurred within the last twelve months, and no monitoring in trends of accidents had occurred. Sickness absence rates were available over a period of 12 months.

Training Initiatives for Occupational Health and Safety:

All employees attended a site specific induction and were given a safety booklet (covers emergency procedures). There were no other specific training programmes in place.

There was no formal Occupational Health input.

PPE:

As a minimum hard hats, high visibility vests and safety boots were provided, and stored at the Site Office.

Health Surveillance:

No specific programmes were in place.

Review of Specific Tasks:

(a) Cutting Treated Cedar

This task was predominantly performed by joiners and labourers cutting lengths of cedar wood using a bench saw. The wood was being cut to fit and was not difficult to handle and generated moderate levels of dust in the breathing zone of operatives and close vicinity. The area was also used by other workers. The task was performed without use of PPE and relied on natural ventilation. The wood was treated with a fire-retardant product. Likely health hazards associated with this task are skin or respiratory irritation, or asthma, and noise induced hearing loss.

Operatives were not aware of the potential health hazard of the task and the equipment was operated without a safety guard. The control rating for the task was considered low as no appropriate engineering controls were in place and operatives did not wear respiratory protective equipment (RPE). Given the product used is a potential carcinogen and respiratory sensitiser the hazard rating was considered high. Given the high hazard with little control, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Use of local extract ventilation
2. Enforce use of RPE
3. Ensure operatives are aware of health and safety hazards of task
4. Provision of guarding for equipment
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(b) Painting/varnishing internal surfaces

This task was performed by painters using rollers and an acrylic varnish. The operatives relied on natural ventilation whilst performing the task, and believed that only a coverall was required. The operatives were not aware of any health outcomes associated with the task and no health problems were reported. This was the main occupation for these employees.

Likely health outcomes associated with the task: skin, eye and respiratory irritation.

The control rating for the task was considered low as no appropriate engineering controls were in place and operatives did not wear respiratory protective equipment (RPE) or gloves. Given the nature and quantities of the product used the hazard rating was considered medium. Given medium hazard with little control, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation (LEV)
3. Ensure operatives are aware of health and safety hazards of task
4. Reporting of health-based symptoms as initial step in health surveillance

COMPANY TWO

Company size/location: 70 full time employees
Approximately 70 subcontractors
North East England (Jarrow)

Nature of Construction Process: Supermarket refurbishment
Finishing off internal surfaces

Safety Management Structure:

There was a Group Safety Manager, 2 Regional Safety Managers, and on site one Safety Adviser and a project manager.

Health and Safety Data:

There was a site specific Health & Safety Policy and Safety Manual for each site covering relevant health and safety legislation. This included a no smoking policy. Sub-contractors were also required to provide copies of their Safety policy and relevant procedures. There were safety and quality method statements for specific tasks, and a permit to work system was in operation. There were specific site safety requirements for all visitors. Emergency procedures were overseen by the site supervisor.

Material Safety Data Sheets were available for all substances used (and a copy was also required to be supplied by subcontractors). There was reporting of accident, and dangerous occurrences and also trends in these. (21 reportable accidents within the last 12 months and 1 dangerous occurrence). Investigations following accidents were carried out by the health, safety and environment team who prepared a report with recommendations.

Noise surveys had been carried out as required, but no other environmental monitoring. There was no formal recording of sickness absence.

Training Initiatives for Occupational Health and Safety:

There was a safety induction for all new staff which included coverage of asthma, skin conditions and medication at work. In addition there were monthly training sessions on safety issues and toolbox talks. The company had gained the Investors in People Award.

All engineers and fire personnel were First Aid trained, and there was a First Aid point at Reception.

There was no formal Occupational Health input.

PPE:

As a minimum hard hats, high visibility vests and safety boot were provided, and stored at the Site Office.

Health Surveillance:

No specific programmes were in place.

Substances used on site and associated safety recommendations:

- (a) Bitumen Primer – hand, eye, breathing protection recommended. Flash point 34°C
- (b) Terrazzo Tiling – hydrated cement and quartz containing aggregates. Hand and breathing protection (dust mask) recommended
- (c) Mastic/Sintolit Resin – 70% styrene and polyester resin. OES 420mg/m³ TWA. Hand, eye, gas fitter respirator and coverall recommended
- (d) Bal Bond SBR – Water-based emulsion of styrene-butadiene with antioxidant. Gloves, disposable respirator and coveralls recommended
- (e) Ardion 90 – Aqueous acrylic dispersion used as additive to ceramic tile adhesive. Gloves, goggles, respirator, coveralls recommended
- (f) Armorex-Proseal – White spirit/aromatic hydrocarbon mix. White spirit OES 100ppm 8-hr TWA; Xylene OES 100ppm 8-hr TWA. PVC gloves, goggles, respirator, coveralls recommended. Skin, mucous membrane and respiratory irritant.
- (g) Mastic asphalt –
 - Limestone OES 4mg/m³ respirable 8-hr TWA
 - Quartz OES 0.3mg/m³ respirable 8-hr TWA
 - H₂S OES 14mg/m³ respirable 8-hr TWA
 - Asphalt-petroleum fumes 5mg/m³ respirable 8-hr TWA
 - Skin burns from contact with hot product. Adequate ventilation required during use
- (h) Dust associated with organic dusts and hard wood OES 5mg/m³
Use of gloves for treated wood and 3M 2405 dust mask + goggles recommended
Barrier cream and after work cream
MSDS mentions risk of nasal cancer and ‘irritating’ nature of dusts
- (i) Wood adhesive – vinyl acetate monomer
Imperious gloves and coveralls recommended plus work in well ventilated areas

Review of Specific Tasks:

1. Grinding Terrazzo Tiles:

This task was predominantly performed by floorers in an indoor area using tiles containing hydrated cement and quartz containing aggregates, and generated moderate to high levels of dust. The task was performed with operatives wearing appropriate RPE and having been provided with appropriate health and safety training for this task. While this task was being performed there were no other operatives in the area. Reliance was placed on natural ventilation and respiratory protection. The main health hazards associated with the task are skin and respiratory, noise, hand arm vibration and ergonomic. Likely health outcomes associated with this task dermatitis, respiratory irritation, noise induced hearing loss, upper limb and hand arm vibration disorder.

The control rating was considered medium as operatives were aware of the health issues associated with the task and wore RPE, but no engineering controls were in place. Given the nature of the quartz based product, the task was given a medium to high hazard rating. Given a medium to high hazard rating with only medium control, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Improvement of local extraction systems
2. Monitoring of specific hazards
3. Task rotation to reduce vibration and ergonomic hazards associated with the task
4. Appropriate health surveillance (noise, respiratory, HAV)

2. Cutting wood

This task was performed by a joiner, using a bench saw and working on hard wood. The wood was not difficult to handle and the task was carried out in a relatively confined space. The operatives relied on natural ventilation, and stated that they were aware of PPE requirements and wore a disposable mask. Safety goggles were not worn. Likely health outcomes associated with the task: skin, eye and respiratory irritation, noise induced hearing loss and musculo-skeletal injury.

The control rating was considered medium as the operatives were aware of the hazard, wore a dust mask and ventilation was adequate although no formal engineering controls were in place. Given the product used is a potential carcinogen and respiratory sensitiser, the hazard rating was considered high. Given a high hazard with medium control, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance
6. Appropriate health surveillance

COMPANY THREE

Company size and location 3 employees
197 subcontractors
East Scotland (Edinburgh)

Nature of construction process: New build – commercial site.
All aspects of finishing off

Safety management structure:

Health and Safety responsibility lies with Contracts Manager, Site Manager and Site Foreman. There are also a number of Group safety reps.

Health and safety data:

There is a generic policy on site available at the start of the project and covering relevant health and safety legislation. The Site foreman updates this as required and adds subcontractors COSHH information. The requirements for each trade are assessed individually. On completion of work on the site all COSHH information is copied and given to client.

There is an ongoing QA and safety audit programme. There is a Safety charter which is also signed by subcontractors. Method statements are posted in the canteens.

First Aiders on site are usually foremen who are identified by stickers on helmet and jackets. The First aid box is located at the site office.

Accident recording data are available plus near misses. This site specific information is fed back to Group headquarters, and comparisons are made with other sites.

Material Safety Data Sheets are available for products used on site. There are no noise survey or airborne monitoring data or data on sickness absence.

There is no specific occupational health provision, although occasionally the company will use the services of a local GP.

Training initiatives for occupational health and safety:

All employees attend an Induction. No medical information is requested at pre-employment. Regular Toolbox talks take place and have recently covered alcohol and dermatitis. There are regular 5 day Site Management Courses. Courses are held on Breathing Apparatus, Work on scaffolding. These are arranged via a Training Coordinator.

PPE:

As a minimum hard hats, high visibility vests and safety boot were provided, and stored at the Site Office. Goggles, masks, and ear plugs were also available on an –as-required basis. The company would supply sub-contractors with PPE if necessary.

Health Surveillance:

No specific initiatives are currently in place. Subcontractor Stonemasons have been subject to health surveillance through their own company.

Review of Specific Tasks:

(i) Stone slab cutting

This task was performed by stonemasons. The task generated moderate amounts of dust. Samples taken on site were analysed gravimetrically and showed dust concentrations in the range from 0.9 to 3.9 mgm³ which suggests that the ventilation in the area used was reasonable for the task performed. The operatives relied on natural ventilation, and stated that they were aware of PPE requirements but were not wearing respiratory protection. No specific reason was given for this decision. Safety goggles were worn. The subcontractor had arranged hand–arm vibration surveillance for the employees performing this task.

Likely health outcomes associated with the task: skin , eye and respiratory irritation, lung disease, noise induced hearing loss hand-arm vibration syndrome and musculo-skeletal injury.

The control rating was considered low as no engineering controls were in place and operatives did not wear RPE. Potentially there is a risk of exposure to quartz which is a human carcinogen and so the task was given a high hazard rating. The residual risk for the task is therefore considered medium to high.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance
6. Appropriate health surveillance

(ii) Spray Painting

This task was being carried out by one worker and supervised by another (painter). A spray gun was used in a large area with windows closed. PPE was worn for the task and included gloves a respirator and goggles. The product used was an Undercoat (Scotts Paints M99) and toluene thinner. This is a high volatility product although it was used in small quantities. The operatives were not aware of any health hazards associated with task and none were reported.

Toluene is assigned an OES. Safety data recommendations are that the product must not be used in a confined space without good ventilation. If the OES is exceeded suitable respirators with organic vapour cartridges must be worn. Splash-proof eye goggles are also recommended.

Likely health outcomes : skin and respiratory irritation. Possible narcotic effects and abnormal heart rhythm if inhaled in high concentrations.

A 3M organic vapour monitors was used with an exposure time of 20 minutes.

Sample	Toluene (ppm)
Exposure time 20 mins	12.9

The short term exposure limit for toluene (15 Minute OES) is 150ppm, and therefore at the time the sample was taken the airborne levels were well within the recommended limit.

The control rating for this task was considered to be low as the task was performed in a poorly ventilated area, with no local extraction and operatives were not aware of the relevant risks. As a solvent thinner was used the task was assigned a medium hazard rating. As the control was poor and the hazard medium, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Reinforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(iii) Cleaning up of Site

The labourers performing this task considered that it was their full time job to keep site clean and tidy. The task observed included sweeping and vacuuming, and generated large amounts of background dust from the joiners, plasterers and fitters as well as the day to day dust seen on all construction sites. In this instance the task was performed in an open area that was well ventilated. One of these workers stated that they received treatment for asthma but did not consider that the condition could be exacerbated by the job. The operatives stated that they occasionally wore masks but often did not bother as no real risk was perceived.

Likely health outcomes associated with the task: respiratory and eye irritation, and musculo-skeletal injury.

The control rating was considered low as the operatives did not wear RPE and were exposed to dust throughout a working day. As the composition of the dust was likely to vary on the basis of the tasks performed, the task was given a medium to high hazard rating. The residual risk for the task was therefore considered medium.

Recommendations for Risk Reduction:

1. Ensure operatives are aware of health and safety hazards of task
2. Consider use of alternative cleaning methods generating less airborne dust
3. Raise awareness of potential dust exposure for other employees working in vicinity
4. Reporting of health-based symptoms as initial step in health surveillance

COMPANY FOUR

Company size and location 49 full time staff
300 subcontractors
North England

Nature of construction process: Refurbishment Rail Station

Safety management structure:

There was a full time Safety Manager on site a minimum of twice weekly, with additional part time support available.

Health and safety data:

There was a Health and Safety Policy, which was updated 2 yearly and included a drug/alcohol policy. There were policies and procedures covering the range of relevant health and safety legislation. This was made available to contractors on request. Contractors were required to complete a project questionnaire and end of contract interviews

There was a Safety matrix, and audit process in operation. The company had Method Statements, Risk Assessment procedures and had COSHH briefings. Safety information was also provided via the Intranet.

Material Safety Data Sheets were available for the substances used.

There had been limited airborne monitoring (eg. lead paint). Noise Surveys were reported to have taken place although results were not available. There were procedures for work with Asbestos. There was a reporting system which considered trends in accident and sickness absence data, which was co-ordinated via the HR department.

Training initiatives:

All employees attended an Induction, and complete a pre-employment health questionnaire and health assessment.

Weekly tool box talks took place. Notice boards mostly displayed Safety based information. There were employee Safety awareness courses, and training on the use of site vehicles and equipment. Training was given on the use of PPE. The company was CITB Approved.

There was no formal occupational health provision. First aiders were present on site and referred injuries to the local accident and emergency department or GP.

PPE:

As a minimum safety boots, high visibility vest and hard hat were provided. Individuals were responsible for maintenance of PPE, which was supplied from a central store.

Skin Care Programme:

Wash facilities had cleanser and barrier cream.

Health Surveillance:

There was no specific programme in place. Although there was a yearly appraisal with staff. It was considered that there were no reported skin or respiratory problems.

Review of Specific Tasks:

(i) Painting

The task was performed by subcontractor painters. The painters used an aluminium based primer and an ethylene diamine based curing agent in moderate amounts. The operatives relied on natural ventilation whilst performing the task although also wore disposable masks.

The aluminium based Primer was Interplus 256. This contains: trimethylbenzene, epoxy resin, methoxypropane, and methylhexan-2-one. The product can cause sensitisation on skin contact and eye irritation. The safety data sheet provided suggests that appropriate respirators should be worn together with safety goggles and impervious gloves and coveralls, to ensure that no skin exposure is likely.

The curing agent used was Interplus 256. This contains: n-xylenediamine, trimethylbenzene, mesitylene and trimethylhexamethylenediamine. It is noted to be harmful on ingestion, irritant to the respiratory tract, can cause skin burns and sensitisation on skin contact. The safety data information indicates that the PPE required is as stated above.

Personal samples were taken from two operatives using 3M organic vapour monitors. Mixed hydrocarbons were measured and levels of 25.7 and 74.4mgm⁻³ were noted over exposure times of 50 and 30 minutes respectively. The levels are within the recommended Occupational Exposure limit but suggest that there is scope for improvement in the level of ventilation.

Likely health outcomes associated with this task are: respiratory and eye irritation, skin burns, contact dermatitis, and prolonged exposure at the exposures recorded could lead to disorientation, headaches and other central nervous system effects. The operatives were not aware of any potential health hazards and no health effects were reported.

The control rating for this task was considered to be low as engineering controls were not used, and operatives did not wear appropriate skin or respiratory protection. As the substances used were potential sensitisers, the hazard rating was considered high. With a high hazard rating and poor controls, the residual risk for the task was high.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of appropriate PPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms and monitoring of skin health by supervisor after appropriate training
6. Respiratory and skin health surveillance

(ii) Cutting concrete slabs

This task was performed by labourers, and generated low amounts of dust. The slabs were approximately 45cms x 45cms and were being cut to fit. Engineering controls were in place in the form of local extraction, plus the operatives wore appropriate PPE. The operatives stated

that they had received training and information on this task, and were aware of possible health hazard associated with the task although no health problems were reported.

Likely health outcomes associated with the task are: skin and respiratory irritation, noise induced hearing loss and musculoskeletal and vibration injury.

The control rating was considered medium to high as there were appropriate engineering controls in place, although no monitoring of actual exposures. Operatives had received training for the task and used appropriate RPE. Given the constituents of the dust, the task was given a medium hazard rating. As the controls were rated medium to high for only a medium hazard, the residual risk for the task was considered low.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Consider task rotation
3. Ensure operatives appropriate training and information on manual handling and vibration hazards of task.
4. Reporting of health-based symptoms as initial step in health surveillance

(iii) Firming base for stone slabs

This task was also performed by labourers and involved firming sand using a 'Thumper'. The machine had a pre-set cycle of 10 minutes and a specific speed. Each cycle was repeated after a 15 minute break. The task was associated with hand-arm vibration. The equipment design limited the period of potential vibration exposure and the job design limited the frequency of exposure. The operator had received training and information on this task. There was an equipment maintenance schedule in place and, the operator wore gloves during the task. As well as performing this task the operative fetched and brought the slabs to the area and cleared away the discarded pieces.

The possible health outcomes associated with the task are musculoskeletal and vibration injury and noise-induced hearing loss.

The control rating was considered medium as there were appropriate design and work cycle controls in place. Operatives had received training for the task and used appropriate PPE. Given the potential for vibration and musculoskeletal injury associated with the task, a medium hazard rating was assigned. As the controls were rated medium for only a medium hazard, the residual risk for the task was considered low.

1. *Recommendations for Risk Reduction:* Consider task rotation
2. Ensure operatives appropriate training and information on manual handling and vibration hazards of task.
3. Reporting of health-based symptoms as initial step in health surveillance

COMPANY FIVE

Company size/location: 20 full time employees
10 Subcontractors (variable)
West Scotland

Nature of Construction Process: Refurbishment of school buildings

Safety management structure:

There was a full time Safety Manager on site on a 2 monthly cycle, but no Safety Representatives.

There was a Health and Safety Policy covering the range of relevant health and safety legislation, with the exception of asbestos. No specific initiatives had arisen as a result of COSHH. The procedures for contractors was being developed and included a Pre-job questionnaire.

Material Safety Data Sheets were not available for all substances used.

There was no airborne monitoring or noise survey data available. There were procedures for work with Asbestos. There was a reporting for accidents and sickness absence data, although no analysis of trends in the data had taken place.

Training initiatives:

All employees attended an Induction.

Regular tool box talks took place on safety issues, and quarterly safety meetings. Notice boards mostly displayed Safety based information. Training was provided for Fork Lift Truck driving.

There was no formal occupational health provision, although there was access to a GP if required. First aiders were present on site.

PPE:

As a minimum Safety boots, high visibility vest and hard hat were provided. Individuals were responsible for maintenance of PPE, which was supplied from a central store.

Skin Care Programme:

Wash facilities had cleanser and barrier cream.

Health Surveillance:

There was no specific programme in place.

Review of Specific Tasks

(i) Cutting compressed boards for Laying floor.

This task was performed by a Joiner in a fairly enclosed space and generated moderate amounts of dust. The task was performed using a circular saw, and involved the use of compressed boards and glass wool. The boards were about 1m x2m and weighed 15-20kg.

The operator relied on natural ventilation during the task and did not wear any PPE. He stated that he usually wore a mask if working with MDF or hard wood. He was not aware of any health outcomes associated with the task and no health problems were reported.

One dust sample was analysed gravimetrically and showed a dust concentration of 3.9mgm^{-3} associated with this task, which suggests that the level of ventilation could be improved.

Likely health outcomes associated with the task: eye injury, skin, respiratory irritation, and musculoskeletal injury.

The control rating was considered low as there were no engineering controls in place, operatives had not received information on relevant health issues and did not use appropriate RPE. Given the constituents of the dust, the task was given a medium hazard rating. As the hazard was rated medium with low controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of PPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(ii) Woodstaining

This task was performed in large classrooms by painters using Dulux woodstain. Operatives relied on natural ventilation whilst performing the task, and believed that only a coverall was required. The operatives were not aware of any health outcomes associated with the task and no health problems were reported. The operatives stated that they drank milk at lunch to get the taste of the product out of their mouths.

Two personal samples were taken during the task using 3M organic vapour monitors over exposure times of 50 and 30 minutes respectively:

Sample	Toluene (ppm)	Xylene (ppm)	Mesitylene(ppm)
1	0.8	1.2	0.1
2	1.8	18.1	0.1

The results suggest that the level of ventilation was satisfactory during the sampling period, but does illustrate differences in exposure between two operatives, particularly in relation to xylene exposure.

Likely health outcomes associated with the task: skin, eye and respiratory irritation.

The control rating for this task was considered to be low, based on a lack of engineering controls, no RPE, and that operatives were unaware of the relevant risks. Operatives were clearly experiencing solvent exposure, and the task was assigned a medium hazard rating. As the control was poor and the hazard medium, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation and appropriate RPE
3. Ensure operatives are aware of health and safety hazards of task
4. Reporting of health-based symptoms as initial step in health surveillance

COMPANY SIX

Company size and location

70 employees
104 subcontractors
Edinburgh

Nature of construction process:

Hotel,
Internal fitting out, Floor tiling/sealing

Safety management structure:

There were two full time Safety Managers, who made monthly visits to sites, and trained project managers on site.

Health and safety data:

There was a generic health and safety policy and site specific information provided by subcontractors. The policy was regularly updated, and covered relevant health and safety legislation. There was a list of approved contractors.

The last RIDDOR reportable accident occurred approximately 12 months ago (Accident Book). No RIDDOR scheme was in operation for health issues.

First aiders were present on site and wore appropriate identification

Material Safety Data Sheets were available for the products used

Confined space monitoring had taken place (as an outcome of COSHH)

Biannual accident reports were sent to the Head Office, although no system existed for reporting accident trends.

Sickness absence rates were monitored for their own staff, although there was no analysis of trends in absence.

There was no specific Occupational Health provision or GP contact.

Training initiatives for occupational health and safety:

All staff attended an Induction.

Monthly toolbox talks were provided mostly on Safety topics (and subcontractors were encouraged to do likewise).

There were weekly Safety & coordination meetings, with weekly safety reports produced.

H&S posters.

Yearly refreshers were provided for foremen grade and higher in changes to relevant Health and Safety legislation.

PPE:

As a minimum, hard hat, high visibility jacket and safety boots were provided, and supplied to subcontractors if required.

PPE was stored at site office.

Concern was expressed about removal of hard hats when using mobile phones.

There was no specific programme for skin care.

Health Surveillance:

Blood lead (plumbers)

Hand/arm vibration (stonemasons)

Review of Specific Tasks:

(i) Tile Laying and cutting

The task was performed by tilers using a stihl saw. This generated low levels of dust in small quantities. The ceramic tiles were approximately 0.5m². The process relied on natural ventilation and engineering controls, local extraction. One team cut, and another laid tiles throughout 8-hour shift.

The operatives were not using PPE. The operatives not aware of any health hazards associated with task and no health problems were reported.

A dust sample was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 7.6 mgm⁻³, which is high, although within the recommended Occupational Exposure Limit (OES).

The likely health outcomes associated with the task were skin, eye and respiratory irritation, noise induced hearing loss and musculoskeletal injury.

Although the dust levels measured were within the OES control of exposure could be improved. The control rating was considered low as there were no engineering controls in place, operatives had not received information on relevant health issues and did not use appropriate RPE. Given the nature of the dust and the other physical or ergonomic hazards present, the task was given a medium hazard rating. As the hazard was rated medium with low controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Introduction of airborne monitoring
2. Ensure use of appropriate RPE
3. Task rotation to reduce ergonomic hazards
4. Ensure operatives are aware of health and safety hazards of task
7. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(ii) Cleaning up site:

The task was performed by labourers using brushes, creating a nuisance dust problem. The process generated moderate levels of dust infrequently. The operatives wore disposable mask and relied on natural ventilation. The operatives did not report any health problems associated with the task.

A dust sample was collected over 55 minutes using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 8.5 mgm⁻³, which is high, although within the recommended Occupational Exposure Limit.

Likely health outcomes associated with the task: skin and respiratory irritation and musculoskeletal injury

The dust levels suggest control measures could be improved. The control rating was considered low to medium as no engineering controls were used, operatives had not received information on relevant health issues. However, they performed the task infrequently and used RPE. Given the nature of the dust and ergonomic hazards present, the task was given a

medium hazard rating. As the hazard was rated medium with low to medium controls the residual risk for the task was considered low.

Recommendations for Risk Reduction:

1. Ensure operatives are aware of health and safety hazards of task
2. Consider use of alternative cleaning methods generating less airborne dust
3. Raise awareness of potential dust exposure for other employees working in vicinity
4. Reporting of health-based symptoms as initial step in health surveillance

(iii) Cutting limestone:

The task was performed by tilers using stihl saw and wet cutting method, which generated low levels of dust in small quantities. (Most stone was precut, therefore the task was performed only as required). PPE was not worn (although available) due to the short duration of the task. Operatives did not report any health problems associated with the task.

Likely health outcomes associated with the task: skin, eye and respiratory irritation noise induced hearing loss and musculoskeletal injury.

The control rating was considered low to medium as although engineering controls were used and the task performed infrequently, operatives were unaware of relevant health issues, and did not use RPE. Given the nature of the dust, physical and ergonomic hazards present, the task was given a medium to high hazard rating. As the hazard was rated medium to high with low to medium controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(iv) Fitting steriboards:

The boards were made up of : Calcium silicate, mica, cellulose fibre, each weighing approximately 10kg. When performing this task Material Safety Data advice recommends the use of safety glasses, skin protection, and a P2 mask if engineering controls not effective for controlling dust emissions.

The task was performed by labourers/joiners using hand held saws and generated moderate levels of dust. PPE was available but not worn, and operatives relied on natural ventilation. The operatives were not aware of any health hazards associated with the task and no health problems were reported.

Likely health outcomes associated with the task: eye injury, respiratory irritation and musculoskeletal injury.

The control rating was considered low as there were no engineering controls in place, operatives had not received information on relevant health issues and did not use appropriate RPE. Given the nature of the dust and the other physical or ergonomic hazards present, the task was given a medium hazard rating. As the hazard was rated medium with low controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(v) Paint Spraying:

The task was performed by painters/fitters by spray technique (Plasti-Kote). PPE was not worn although available, with operatives relying on natural ventilation. This is a high volatility product although it was used in small quantities. The operatives were not aware of any health hazards associated with the task and none were reported.

Plasti-Kote contains acetone, ethanol, xylene and methyl ethyl ketone and butane which all have an OES. Safety data recommendations are that the product must not be used in a confined space without good ventilation. If the OES is exceeded suitable respirators with organic vapour cartridges must be worn. Splash-proof eye goggles are also recommended.

Likely health outcomes associated with the task: skin and respiratory irritation. Possible narcotic effects and abnormal heart rhythm if inhaled in high concentrations.

Two samples were taken using 3M organic vapour monitors with an exposure time of 65 and 55 minutes respectively. The results are well within the Occupational Exposure Limits for the substances identified, and suggest the level of ventilation at the time of sampling was satisfactory.

Sample	Hexane (ppm)	Toluene (ppm)	Xylene (ppm)	TMBs (ppm)
1	4.9	0.4	0.2	1.4
2	0.1	<0.1	<0.1	<0.1

The control rating for this task was considered to be low, based on lack of local extraction and operatives were not aware of the relevant risks and did not wear RPE. As the products used have the potential to cause serious health effects the task was assigned a medium to high hazard rating. As the control was poor and the hazard medium to high, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(vi) Protective Coating on Marble Slabs:

The task was performed by tilers and labourers using Lithofin MN Stain-stop (containing white spirit and ethylacetate). This moderate volatility product was used in large quantities. Vapour masks were worn by the operatives who also relied on natural ventilation. The operatives not aware of any health hazards associated with task and none were reported.

Likely health outcomes associated with the task: skin and respiratory irritation.

The control rating for this task was considered to be low, based on lack of local extraction and operatives were not aware of the relevant risks although wore vapour masks. As the products were used in large quantities and have the potential to cause health effects the task was assigned a medium to high hazard rating. As the control was poor and the hazard medium to high, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Ensure operatives are aware of health and safety hazards of task
4. Reporting of health-based symptoms as initial step in health surveillance

COMPANY SEVEN

Company size and location:

8 Full time operatives
27 subcontractors (8 operatives)
South East England

Nature of Construction process:

Refurbishment of Office premises
Fitting core boards
Drylining

Safety Management Structure:

There were four full time safety managers with appropriate qualifications.

Health and safety data:

There was a generic health and safety policy which covered relevant health and safety legislation.

Two first aiders were on site and one appointed person. They were identified at induction, named at the site entrance and by badges on their hard hats.

Material Safety Data Sheets were available for the products used.

Limited airborne monitoring had taken place.

The company had their own noise monitoring equipment

Accident book and data recorded. No trend data was recorded or evaluated. A RIDDOR reporting scheme was in place but was not used to report occupational disease.

There was no recording of sickness absence data.

Access to an Occupational Health nurse was available if required. Other health problems were referred to a local GP. Pre-employment screening was used.

Training initiatives for occupational health and safety:

All employees attended an Induction

Toolbox talks took place on a regular basis and covered mostly Safety topics

Leaflets and posters were displayed on relevant issues

Site Managers attended modular training in Health and Safety

PPE:

As a minimum, hard hats, high visibility vest, and safety boots were provided.

A PPE register was available but acknowledged that it was difficult to maintain. PPE was stored at the site office.

Health Surveillance:

No specific initiatives were in place.

Review of Specific Tasks:

(i) Fire/core board cutting:

This task was performed by labourers using a bench saw. 12.5kg boards were cut on an 'as required' basis. The task generated large quantities and high levels of dust.

Mechanical suction was applied and process took place in plastic enclosure. Operatives wore disposable masks but spent a maximum of 8 minutes at any time in enclosure. Dust escaped frequently from the enclosure, and settled on nearby surfaces. DustTrak registered 70-90 mgm^{-3} whilst the extraction was in use. This was reflected in the results of dust sampling. Two dust samples were analysed gravimetrically, and showed dust concentrations of 44.9 and 97.9 mgm^{-3} , which illustrate poor control.

The operatives were not aware of specific health problems associated with task but reported dermatitis in relation to other tasks such as handling concrete. Likely health outcomes associated with the task: skin and respiratory irritation.

Core boards comprise a core of calcium sulphate dihydrate encased in plastic liners. They contain a silicon additive and small quantities of glass fibre and vermiculite. Safety Data Sheet suggests the material is irritant to eyes, skin, respiratory system, and recommends a half face respirator if dust cannot be controlled. Goggles and skin protection are also recommended.

The control rating was considered low to medium as although engineering controls were used they were not effective. Operatives exposure was intermittent but they used dust masks instead of half mask respirators and exposure also occurred outside the enclosure. Given the nature of the dust, physical and ergonomic hazards present, the task was given a medium to high hazard rating. As the hazard was rated medium to high with low to medium controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Review effectiveness of control measures
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(ii) Cleaning Site:

The task was performed by labourers using brushes. The operatives stated they had tried hoovering and damping with little effect. The task generated large quantities of high dust levels from general dust and core board cutting.

The operative wore a disposable mask and relied on natural ventilation. The operatives were not aware of any health outcomes associated with task and none were reported. Likely health outcomes associated with the task: respiratory and eye irritation.

The control rating was considered low as no engineering controls were used, operatives had not received information on relevant health issues, although they used dust masks. Given the nature and quantities of the dust, the task was given a medium hazard rating. As the hazard was rated medium with low controls the residual risk for the task was considered low.

Recommendations for Risk Reduction:

1. Ensure operatives are aware of health and safety hazards of task
2. Consider use of alternative cleaning methods generating less airborne dust
3. Raise awareness of potential dust exposure for other employees working in vicinity
4. Reporting of health-based symptoms as initial step in health surveillance

(iv) Fixing Bolts:

The task was performed by a joiners' labourer using epoxy acrylate resin, a moderate volatility product used in small quantities.

The operative was not wearing mask or gloves and relied on natural ventilation. He was not aware of any health problems associated with the task and none were reported. The operative was fitted with a passive sampler, but it was not possible to locate him again before leaving site.

Likely health outcomes associated with the task: skin and respiratory irritation, and potential sensitisation.

The control rating was considered low as engineering controls were not used, and operatives did not wear appropriate skin or respiratory protection. As the substance was used in small quantities it is potentially a skin sensitiser, and so the hazard rating was considered medium to high. With a medium to high hazard rating and poor controls, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance
6. Appropriate health surveillance.

COMPANY EIGHT

Company size and location	10 full time employees 100 subcontractors North East England (Sunderland)
Nature of construction process:	Painting external surfaces Fitting flooring, ceilings, windows, electrical supply and furniture New build – School premises
Safety management structure:	3 full time safety managers visit site 6-weekly.

Health and safety data:

There was a generic Health and Safety policy covering relevant health and safety legislation, which had been last updated in December 2000. The policy included the recently updated environmental policy. The company had a RoSPA award for safety.

There were three first aiders on site identified at Induction and by appropriate badges. There was an incident reporting scheme in place and a system of emergency contacts. There had been no reportable RIDDOR incidents in the last 12 months.

Material Safety Data Sheets were available for the products used.

A recent noise survey had been carried out due to proximity of the site to local housing, although the results were reported to be below the Action Level.

No airborne monitoring data were available

Data on accidents and absence were maintained by head office

There was no specific occupational health provision.

Provision of skin care products; handcare (Scopol, not used much).

Training initiatives for occupational health and safety:

All employees attend an Induction

Toolbox talks take place at intervals and have included information on manual handling

Posters on relevant topics were displayed in the welfare facilities (occasionally use HSE leaflets)

Weekly site meetings and quarterly updates on health and safety were held for site managers.

There was an Intranet that could be used for disseminating relevant information on health and safety.

In-house training was also provided for specific groups (e.g. joiners)

PPE:

Standard minimum provision was available, and stored in the site office. This was issued as required, and there was a tracking system, although it was acknowledged that it was difficult to maintain.

Health Surveillance:

No specific initiatives were in place.

Review of Specific Tasks:

(i) Cleaning site

The task was performed by labourers using brushes. The task generated large quantities of dust. The operatives tended to rely on natural ventilation, stating that PPE was not worn unless working near the stihl saw as it was felt to restrict breathing. The operatives were not aware of type of dust generated. Operatives were not aware of any health outcomes associated with task and none were reported.

Likely health outcomes associated with the task: skin and respiratory irritation.

The DustTrak reading recorded 10-12 mgm^{-3} , which suggests that the level of natural ventilation at the time of the measurement was inadequate. A dust sample taken using 25mm glass fibre filter, and analysed gravimetrically showed a dust concentration of 8.3 mgm^{-3} .

The control rating was considered low as no engineering controls were used, operatives had not received information on task related health issues, and did not wear RPE. Given the quantities of dust generated, the task was given a medium to high hazard rating. As the hazard was rated medium to high with low controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Ensure operatives are aware of health and safety hazards of task
2. Consider use of alternative cleaning methods generating less airborne dust
3. Raise awareness of potential dust exposure for other employees working in vicinity
4. Reporting of health-based symptoms as initial step in health surveillance

(ii) Fitting units made of MDF

Data sheets were not available at the time of the visit for this material. The task was performed by joiners/fitters using electric hand drills. The task generated small quantities of coarse dust. The operatives did not wear RPE as they considered dust levels were low and instead relied on natural ventilation. The operatives were aware of potential health effects associated with MDF, but no health problems were reported.

A dust samples was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 0.3 mgm^{-3} , within the recommended Occupational Exposure Limit.

Likely health outcomes associated with the task: skin, respiratory and eye irritation and musculoskeletal injury.

The control rating was considered low as no engineering controls were used, and operatives did not wear RPE even though they had received information on relevant health issues. Given the nature and quantities of the dust, the task was given a medium to high hazard rating. As the hazard was rated medium to high with low controls the residual risk for the task was considered medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(iii) Undercoating of walls

The product used was Johnstone's undercoat which is a solvent based paint. The manufacturers recommend that this is only used in a well-ventilated room, and that appropriate respiratory protection is required in poorly ventilated areas. It is considered irritant to the eyes, nose and respiratory tract.

The task was performed by painters using brushes in a small room with no windows. The product was of medium-high volatility. Operatives would only wear respiratory protection if the smell was intolerable, and in general tended to rely on natural ventilation. The operatives were not aware of any health hazards associated with the task and no health problems were reported.

One sample was taken using 3M organic vapour monitors with an exposure time of 45 minutes. The results are well within the Occupational Exposure Limits for the substances identified, and suggest the level of ventilation at the time of sampling was satisfactory.

Sample	Benzene (ppm)	Toluene (ppm)	Xylene (ppm)	Mesitylene(ppm)
1	<1	<1	3	<1

Likely health outcomes associated with the task: skin, eye and respiratory irritation.

Although the samples taken suggested exposures were within the OESs, the control rating for this task was considered to be low. This was based on lack of local extraction and operatives were not aware of the relevant risks and did not wear RPE despite being aware of solvent vapour. As the products used have the potential to cause significant health effects the task was assigned a medium to high hazard rating. As the control was poor and the hazard medium to high, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training
6. Appropriate health surveillance

(iv) Painting walls using vinyl emulsion

The product used was Johnstone's vinyl emulsion which is a water based paint. The task was performed by painters using spray technique or brushes. The product was of low volatility. The operatives only tended to wear respiratory protection if spray painting and made this decision themselves. Otherwise the operatives relied on natural ventilation. They reported the smell being problematic when floor painting. Operatives reported being made aware of potential health hazards associated with the task at induction but no health problems were reported.

Likely health outcomes associated with the task : skin and upper respiratory irritation.

The control rating for this task was considered to be low. This was based on lack of local extraction and operatives did not wear RPE. As the products used was of low volatility, but potentially used in spray application or large quantities the task was assigned a medium hazard rating. As the control was low the hazard medium, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Recommend use of RPE
2. Ensure operatives are aware of health and safety hazards of task
3. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(v) Laying Screed for vinyl floor

The task was performed by floor layers using Forbofix Screed Master (adhesive vinyl floor covering and latex liquid). The product contains cyclohexane and methanol and was of low-moderate volatility. The Material Safety Data Sheet recommends skin and eye protection, although respiratory protection is not recommended.

The Laybond Screedmasterlatex liquid contains ammonia, and it is recommended to be used only in well ventilated areas and avoiding skin contact. The use of a respirator is recommended in confined areas, with appropriate skin and eye protection. The latex powder contains cement and lime, and can cause serious irritation or burns to skin and eyes, and the respiratory tract. The product has an OES of 5mgm^{-3} , and a respirator is advised for exposure above the OES, along with appropriate skin and eye protection.

The operative stated that he would only wear RPE if he felt there was a risk. He was unaware of any health outcomes associated with the task and none were reported.

Likely health outcomes associated with the task: skin and respiratory irritation, and potential sensitisation.

The control rating for this task was considered to be low. This was based on lack of engineering controls, the operatives were not aware of the relevant risks and did not wear RPE. As the products used have the potential to cause significant health effects the task was assigned a high hazard rating. As the control was poor and the hazard high, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

COMPANY NINE

Company size and location 3 employees,
10-40 subcontractors dependent on task
West Lothian, Scotland

Nature of construction process: Painting external surfaces
Paving, sanding floors and fitting out
Commercial site

Safety management structure:

There was one full time and one part time safety manager who visited the site monthly.

Health and safety data:

A generic health and safety policy was available covering relevant health and safety legislation. Subcontractors were required to provide method statements prior to starting a new job.

The Site manager was the First Aider. There had been no RIDDOR reportable incidents in the last 12 months.

Material Safety Data Sheets were available for products used.
No noise surveys or airborne monitoring data were available.
Data on accidents and absence were maintained by head office.

There was no specific occupational health provision.
Swarfega was the only available product for skin care.

Training initiatives for occupational health and safety:

All employees attended an Induction
There were two-weekly toolbox talks – topics directed by Head office, and mostly Safety focused.
Posters were used to emphasise good practice and occasionally HSE leaflets.
Site managers undergo CITB training. Training was provided on CDM Regulations approximately 1 year ago.

PPE:

The standard minimum provision was available, and was stored in site office and supplied by the Site manager.

Health Surveillance:

There were no specific initiatives in place.

Review of Specific Tasks:

(i) Cutting and laying concrete slabs

The task was performed by labourers using 50kg slabs, sand and cement. Slabs are normally cut using a stihl saw. The process was not in operation at the time of the visit as the equipment was requiring repair. The task involved potential manual handling, skin, respiratory, noise and vibration hazards.

The operatives were aware of some potential health hazards associated with the task but did not routinely use RPE. No specific health problems were reported by the operatives.

Dust samples was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 4.2 mgm⁻³, within the recommended occupational exposure limit.

Likely health outcomes associated with the task: skin, respiratory irritation, noise induced hearing loss, vibration and musculoskeletal injury.

The control rating was considered low, based on lack of engineering controls, and although operatives were aware of the relevant risks they did not wear RPE. Due to the potential health hazards from dust, physical and ergonomic hazards, the task was assigned a medium hazard rating. As the control was poor and the hazard medium, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Reporting of health-based symptoms as initial step in health surveillance
5. Health surveillance for vibration, skin and respiratory hazards
6. Training in manual handling

(ii) Soldering joints

The task was performed by a plumber using solder flux in small quantities that generated small quantities of local fume. The operative was aware of the potential health hazards associated with the task but did not use PPE and tended to rely on natural ventilation. The operative was not aware of the constituents of the solder process. The operative reported episodes of bronchitis but felt this was more likely due to being a heavy smoker.

Likely health outcomes associated with the task: skin and respiratory irritation

This was based on lack of engineering controls and operatives were not aware of the relevant risks and did not wear RPE. As the solder has the potential to cause respiratory health effects the task was assigned a medium hazard rating. As the control was poor and the hazard medium, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Respiratory surveillance
5. Health education on smoking cessation

(iii) Sanding floors

The task was performed by a floor layer subcontractor using a sander and a slurry mix (Isocrete Gyvlon Binder). The slurry contained calcium sulphate, and is noted to be an irritant to eyes, skin and respiratory tract. The manufacturers recommend that it is used in a well-ventilated area, and operatives should wear impervious gloves, enclosed eye protection, protective clothing and a suitable dust mask when dust cannot be controlled. The operatives used for dust extraction an industrial vacuum cleaner normally used for cleaning up. The

process covered a wide area and generated moderate levels of dust. This was the subcontractors' sole task at that time but they tended to rotate onto other jobs dependent on the work programme.

The operative stated he had been informed of potential health hazards associated with the task by his boss and to wear hearing defenders. He stated he wore respiratory protection for other types of flooring. The operative did not report any health problems associated with the work.

Likely health outcomes associated with the task: skin, respiratory and eye irritation, vibration and musculoskeletal injury.

The control rating was considered low, based on lack of engineering controls, and although operatives were aware of the relevant risks they did not wear RPE, although used hearing protection. Due to the potential health hazards from dust, physical and ergonomic hazards, the task was assigned a medium hazard rating. As the control was poor and the hazard medium, the residual risk for the task was medium.

Recommendations for Risk Reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. More frequent task rotation to reduce ergonomic and vibration hazards associated with task
5. Reporting of health-based symptoms as initial step in health surveillance
6. Health surveillance programme

COMPANY TEN

Company size and location 5 employees,
60 subcontractors (from 14 companies)
West Scotland

Nature of construction process Conversion to flats of former building
Painting and stonework
Carpet Laying

Safety management structure:

There were two full time Safety Managers who visited the site fortnightly

Health and safety data:

There was a generic health and safety policy covering relevant health and safety legislation. (Includes smoking and drugs/alcohol policy).

Audits were carried out by the Regional Director on a random basis.

The contractors are required to complete pre-job questionnaires (assessment of competence, risk assessments and environmental precautions).

First Aiders on site were identified at induction and by badges on hats.

Material Safety Data Sheets were available for the products used.

There was no airborne monitoring data.

Recent noise surveys had been carried out due to local complaints (no records available on site).

There was an Accident book kept on site – with one RIDDOR reportable accident in the last 12 months. There was no trend data for accidents, and no data kept on sickness absence.

There was an optional private healthcare scheme for all employees, and those above a certain grade had access to BUPA. There was no specific occupational health provision.

Swarfega and barrier cream were supplied for skin care purposes.

Training initiatives for occupational health and safety:

All staff received Induction training.

Toolbox talks occurred every month and were mostly safety-based.

Health and Safety posters were displayed in the site office and in the washing facilities.

In-house training was provided on specific topics e.g. vibration and site transport.

PPE:

Standard minimum provision, and also provided to subcontractors if required

Issue record kept for PPE and stored at site office.

Health Surveillance:

No specific initiatives were in place, although the Health and Safety policy mentioned requirements for surveillance for dust, fumes and noise at managers' discretion and statutory requirements for asbestos, lead, ionising radiation and work in compressed air.

Review of Specific Tasks

(i) Removal of sandstone and mortar

This task was performed by stonemasons using hammers and chisels. The work was self paced and the maximum loads handled approximately 3kg. The task generated high levels of dust in large quantities. Operatives wore hearing defenders and respiratory protection was also worn, based on the company's risk assessment of the process. The operatives were aware of health risks associated with the task but no health problems were reported. The task took place in a relatively well (naturally) ventilated area.

Likely health outcomes associated with the task: skin, respiratory and eye irritation, musculoskeletal injury and hearing loss.

A dust samples was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 49 mgm^{-3} , which exceeds the recommended Occupational Exposure Limit.

The control rating was considered moderate as the operatives were aware of the relevant risks, wore RPE and hearing protection. However no other engineering controls wer used and exposures had not been monitored. Due to the potential health hazards from dust, physical and ergonomic hazards, the task was assigned a medium hazard rating. As the control was medium and the hazard medium, the residual risk for the task was considered low.

Recommendations for Risk Reduction:

1. Consider use of local extract ventilation
2. Reinforce use of PPE
3. Regular maintenance schedules for work equipment
4. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

(ii) Painting

This task was performed by painters using acrylic paint applied by brushes and rollers. The product was used in moderate quantities and had moderate volatility. The operatives used coveralls to protect clothing but no other PPE. Reliance was placed on natural ventilation unless the smell was unpleasant. The operatives were not aware of any health risks associated with the task and no health problems were reported.

One sample was taken using 3M organic vapour monitors with an exposure time of 45 minutes. The results are well within the Occupational Exposure Limits for the substances identified, and suggest the level of ventilation at the time of sampling was satisfactory.

Sample	Benzene (ppm)	Toluene (ppm)
1	<1	<1

Likely health outcomes associated with the task: skin and respiratory irritation.

Although the samples taken suggested exposures were within the OESs, the control rating for this task was considered to be low. This was based on lack of engineering controls, operatives were unaware of the relevant risks and did not wear RPE despite being aware of solvent vapour. As the products used have the potential to cause significant health effects the task

was assigned a medium to high hazard rating. As the control was poor and the hazard medium to high, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Monitoring of airborne exposures
2. Use of local extract ventilation
3. Enforce use of PPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance and monitoring of skin health by supervisor after appropriate training

COMPANY ELEVEN

Company Size/Location	4 full time employees (1 part time) 30 subcontractors (preferred list) West Midlands
Nature of Construction Process	Residential homes, new build Painting and electrical fitting out.
Safety Management Structure	Full time safety manager. Technical manager on a site specific basis.

Health and Safety Data:

There was a generic policy on site at the start of the project (last updated 1997) and covering relevant health and safety legislation. Method statements were available for all risk assessments. Comparisons are made across all sites and information made available to all sites. A safety rating exercise is carried out on a monthly basis. Subcontractors are asked to follow the same procedures and there is a pre-contract meeting with subcontractors.

Material Safety Data Sheets were available for products used on site. First Aiders are present on site. Accident data included reporting of trends over the last three years (none RIDDOR reportable). Sickness absence data is stored at head office. Noise levels on the site were assessed as acceptable. A noise abatement order was also in operation.

There was no specific occupational health provision.

Training Initiatives for Occupational Health And Safety:

All employees attend an induction, and toolbox talks took place on a monthly basis. The head office also issued quarterly safety updates. Posters were used to highlight specific health and safety issues and occasionally HSE leaflets.

PPE:

As a minimum, hard hats, high visibility vest, and safety boots were provided. A PPE register was also available but was said to be difficult to maintain.

Health Surveillance :

There were no specific initiatives in place

Review of Specific Tasks:

(i) Screed cutting

This task was performed by labourers using a disc cutter. The task generated moderate amounts of mixed plaster and used dust. The operatives relied on natural ventilation and stated that they were aware of PPE requirements but were not wearing respiratory protection. No specific reason was given for this decision. Safety goggles were not worn.

Operatives were not aware of any adverse health outcomes and none were reported. A dust sample was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 4.9 mgm^{-3} , within the recommended Occupational Exposure Limit.

Likely health outcomes associated with the task: skin, eye and respiratory irritation and hand-arm vibration syndrome and musculoskeletal injury.

The control rating for this task was considered to be low. This was based on lack of engineering controls, and although the operatives said they were aware of RPE requirements, none was worn. Due to the nature of the dust, and other hazards associated with the task it was assigned a medium to high hazard rating. As the control was low and the hazard medium to high, the residual risk for the task was medium.

Recommendations for Risk reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce use of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance

(ii) Painting

The task was performed by painters. The painters used Bergers Superflat emulsion, with a toluene thinner. The paint contained ethane-1,2-diol, and nonylphenoethoxylate, and the manufacturers recommend that adequate ventilation should be provided during use, and additional extraction if ventilation is unsatisfactory. It is also highlighted that repeated skin contact can result in non-allergic contact dermatitis, and the paint can also cause eye irritation.

The operatives relied on natural ventilation whilst performing the task. The operatives were not aware of any potential hazards and no health effects were reported.

A 3M Passive badge sampling was taken, and an exposure time of 65 minutes yielded toluene levels of 2ppm. This suggests that the level of ventilation during the monitoring period was satisfactory.

Likely health outcomes associated with this task are: respiratory, eye and skin irritation.

Sample analysis suggests exposures were within the OESs, however the control rating for this task was considered to be low. This was based on lack of engineering controls, operatives were unaware of the relevant risks and did not wear RPE. Due to the nature of the products used and the potential health effects the task was assigned a medium to high hazard rating. As the control was poor and the hazard medium to high, the residual risk for the task was therefore rated as medium.

Recommendations for Risk Reduction:

1. Use of local extract ventilation
2. Enforce use of PPE
3. Ensure operatives are aware of health and safety hazards of task
4. Reporting of health-based symptoms and monitoring of skin health by supervisor after appropriate training

(iii) Fitting Electrics into Plasterboard

The task was performed by electricians using drills and generated moderate levels of dust. RPE was available but not worn, and operatives relied on natural ventilation. The operatives

were not aware of any health hazards associated with the task and no health problems were reported. They had access to relevant Material Safety Data Sheets.

A dust sample was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 2.8 mgm^{-3} , within the recommended Occupational Exposure Limit.

Likely health outcomes associated with the task: eye injury, respiratory irritation and musculoskeletal injury.

Sample analysis suggests exposures were within the OESs, however the control rating for this task was considered to be low. This was based on lack of engineering controls, operatives were unaware of the relevant risks and did not wear RPE although it was available. Due to quantities of dust generated, and other potential health hazards of the task, it was assigned a low to medium hazard rating. As the control was low and the hazard low to medium, the residual risk for the task was therefore rated as low.

Recommendations for Risk reduction:

1. Measurement of airborne exposures
2. Use of local extract ventilation
3. Enforce of RPE
4. Ensure operatives are aware of health and safety hazards of task
5. Reporting of health-based symptoms as initial step in health surveillance.

(iv) Forklift Truck Driving

The operative had been provided with training in task. Potentially he was intermittently exposed to background levels of wood, cement and general dust from other tasks. He did not wear any specific respiratory protection. He was not aware of any health outcomes associated with the task.

The control rating was considered low as the operative was potentially exposed to dust without the use of RPE, however this was at background levels and on an intermittent basis. Appropriate training had been given and so the task was given a low hazard rating. Therefore the residual risk for the task was considered low.

Recommendations for Risk Reduction:

1. Recommend use of RPE
2. Ensure operatives are aware of health and safety hazards of task
3. Reporting of health-based symptoms as initial step in health surveillance

COMPANY TWELVE

Company Size/Location:	69 people on site (35 subcontractors 33 full time employees, 1 part time) North of England
Nature of Construction Process:	Conversion of public sector building into Domestic dwellings. Flooring, fitting out
Safety Management Structure:	5 full time safety managers and 1 part time Company wide. One health and safety rep on site

Health and Safety Data:

There was a generic policy reviewed annually by the Group Health and Safety Director. Copies available for contractors. Site-specific procedures apply. The company have a preferred list of subcontractors, all required to complete a pre-job questionnaire to a specific standard.

There are usually 2 First Aiders on each site identified by badges on hats and at induction. Accident data recording included a system to identify major injuries for RIDDOR. Site-specific information is fed back to site but there is no reporting of trends across sites although this is being developed. There were no data collected on sickness absence or airborne monitoring although medical certificates were reviewed to identify industrial disease. Noise surveys were not carried out routinely but as part of a planning requirement. Material Safety Data Sheets were available for products used on site.

Access was provided on an *as required* basis to an occupational physician. The company had recently introduced well person assessments for monthly paid staff that were nurse-led.

Training initiatives for occupational health and safety were being developed in relation to skin disease.

All employees attend an induction that includes information on relevant health and safety policies and leptospirosis.

Toolbox talks take place on at least a quarterly basis with the topics decided by the site manager and subcontractors as part of the 'Working Well Together' scheme. Monthly safety committee meetings include subcontractor and employee representatives.

Posters and notice boards are used in shared areas to highlight specific issues. The company had also developed a range of in-house material. Most of training was provided in-house and the company welcomed more guidance on health surveillance.

PPE:

As a minimum hard hats, jackets and safety boots were provided with hearing defenders, masks and goggles as required as need identified by the H&S adviser, site manager or individual.

Skin Care:

First Aiders were being trained to recognise problems. Three part skin care programme in place.

Health Surveillance:

There was a system in place to ensure subcontractors met health and safety requirements for example, asbestos regulations. Medical certificates were being reviewed to identify potential work-related illness and where appropriate arrange further follow-up.

Review of Specific Tasks:

(i) Applying silicone sealant

This task was performed by a tiler and labourer using a silicone sealant and fungicide on bathroom fittings. They used fingertips to smooth down the sealant. The task was performed in a relatively enclosed space with limited ventilation, although used in small quantities. The operatives relied on natural ventilation and did not wear PPE although they stated being aware of any potential health risks associated with the task. The operatives attributed irritation of the skin on their hands to the use of a proprietary general purpose cleaner.

Likely health outcomes associated with the task: skin and respiratory irritation.

The control rating for this task was considered to be low. This was based on lack of engineering controls, and the task being performed in a relatively confined space. Although the operatives were aware of the relevant risks they did not wear skin protection or RPE. Due to the actual cases of skin irritation noted, and the potential for other health effects the task was assigned a medium hazard rating. As the control was low and the hazard medium, the residual risk for the task was therefore rated as medium

Recommendations for risk reduction:

1. Improve level of ventilation
2. Reinforce use of appropriate PPE
3. Ensure operatives aware of H&S hazards of task
4. Encourage reporting of health-based symptoms

(ii) Cutting compressed board

This task was performed by joiners using a circular saw on MDF without any collection system for the dust generated. The task generated moderate quantities of dust. The operative wore a 3M particulate respirator appropriate for the task and stated that they were aware of the potential health risks associated with MDF. Ear plugs were also worn. No adverse health outcomes were reported in association with this task.

A dust sample was taken using 25mm glass fibre filter, and analysed gravimetrically, and showed a level of 5.3mg^{-3} . Appropriate PPE was worn by operatives.

Likely health outcomes associated with the task: Skin and respiratory irritation, eye injury, noise-induced hearing loss, hand/arm vibration syndrome.

Based on existing controls, the control rating was considered medium as operatives were aware of the health hazards and wore appropriate RPE and hearing protection, although no local extraction was used. Given the range of potential health effects associated with the task it was given a medium hazard rating. Therefore as the control was medium and the hazard rating medium, the residual risk for the task was considered low.

Recommendations for risk reduction:

1. Use of local extract ventilation
2. Consider measurement of airborne exposures
3. Reporting of health-based symptoms as initial step in health surveillance

(iii) Tiling

This task was performed by a tiler using moderate amounts of ceramic tile adhesive. The task was performed in a relatively confined space with limited natural ventilation. The operative did not wear any specific PPE and stated that he would wear gloves if his hands felt sore. He was not aware of any health risks associated with the task and none were reported. He reported using soap and water only as part of a skin care regime.

Likely health outcomes associated with the task: Skin and respiratory irritation. The control rating was considered low as operatives were unaware of the health hazards and did not wear appropriate RPE or skin protection, and the task was performed in a poorly ventilated area. Given the potential health effects associated with the task it was given a low to medium hazard rating. Therefore the residual risk for the task was considered low to medium.

Recommendations for risk reduction:

1. Improve level of ventilation during task
2. Reinforce use of PPE
3. Ensure operatives are aware of health and safety hazards of task
4. Reporting of health-based symptoms as initial step in health surveillance
5. Improve training on skin care regime

APPENDIX 3

HOW TO COMPLETE THE RECORDING FORM

The aim of this recording form is to help you identify health problems which might be associated with certain aspects of your job, and to identify steps you can take to reduce the risk for employees working on those jobs, or in the same area.

When using the form it is important to consider one task at a time. It is helpful to get an overview of all the tasks involved in the construction process that you are currently working on. A separate record form should be completed for each task identified.

Task Detail(s) (A)

Consider what happens during the job. Does it generate dust or fumes? Is it noisy? Does it involve using tools that vibrate or require prolonged gripping or awkward posture? Does the job involve moving or handling loads over 10kg?

Area of Body Affected (B)

This section indicates which body parts might be affected during the task. For example, grinding or sanding might generate dust that could be breathed in or cause eye injury if airborne. If the material used is abrasive or dries the skin, this could cause skin irritation.

Rating Risk (C)

How much dust or fume is produced will in part determine the risk of health effects associated with this job. Is it difficult to see or breathe freely in the work area (high)? Is there a lot of dust on surfaces (moderate)? Is there little evidence of dust or only occasional odour (low)?

Is the task so noisy that you cannot hear anyone shout at you (high noise) or can you still shout above the noise (moderate) or still have a conversation (low)?

If the job involves lifting or using tools – how heavy is the load being lifted (<10kg; 10-25kg; >25kg) and how often is the task performed without a brief rest period? Are employees often working in cramped or awkward positions or using vibrating tools for a prolonged period?

Controls Used (D)

This section gives a list of measures that might be used to reduce the level of exposure to the hazards identified in section A.

Residual risk (E)

If the control measures used are effective in protecting the employee from being exposed to the hazard and also protect other people working in the same area then the residual risk to health will be low. If the control measures are only partially effective, the residual risk may be moderate or high dependent on how you rated the task in Section C.

Steps to Further Reduce Risk (F)

If the current measures are not totally effective in protecting employees performing the task consider what other measures could be taken to reduce the risk of health problems associated with this job.

Which Groups of Employees (G)

Finally consider what other groups of employees may be affected. Not only those performing the task but those working in the same area.

RECORDING FORM

Task Details (A)	Area Of Body Likely To Be Affected (B)	How Would You Rate The Risk Of This Task? (C)	What Controls Are Used? (D)	Considering The Controls – What Is Residual Risk? (E)	What Steps Could Be Taken To Reduce Risk? (F)	Which Groups Of Employees Should Be Considered? (G)
Main Hazard Associated With Task						
1. Dust generated (e.g. sanding, cutting, cleaning)	Irritation to: Skin Eyes Nose/throat Lungs	How much/How dusty? Low/Medium/High	(a)Open Windows/doors (natural ventilation) (b)Extraction systems (c)Engineering controls e.g:	Low	(a)Monitor airborne exposures	(a)Labourers
2. Chemicals used (e.g. thinners, paints adhesives)						
3. Noise	Ears	How noisy? Low/Medium/High	(i)Enclosure (ii)Mechanical aids (iii)Damping	Medium	(b)Improve ventilation	(b)Joiners
4. Handling or moving loads	Neck Back Shoulders	How heavy/How often? Low	(d)Job rotation/ Team working (e)Protective equipment (f)Staff training or Provision of Information (g)None	High	(c)Enclose task (d)Other engineering controls (e)Rotation onto other tasks (f)Provide PPE (g)Upgrade PPE (h)Staff training (j)Reporting system for health symptoms (k)Health surveillance required	(c)Fitters (d)Floorers (e)Plumbers (f)Painters (g)Drivers (h)Welders (j)Stonemasons (k)Others (specify) ..
5. Frequent repetition or requires force to be applied	Arms Hands Legs					
6. Vibration to hand or whole body	Hand/arm Whole body	High				



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