

Healthy Workplaces Good Practice Awards 2018-2019

CASE STUDY

Eliminating risks from respirable crystalline silica dust in the construction sector



ORGANISATION/COMPANY

BAM Ireland

COUNTRY

Ireland

SECTOR

Construction

TASKS

Construction activities, such as drilling and cutting, involving silica-containing materials



Source: BAM Ireland.

Background

Construction workers are at risk of exposure to respirable crystalline silica (RCS), which causes silicosis and other lung diseases and is classified as a

carcinogen. Tasks that may result in the production of RCS dust include drilling and cutting materials that contain silica, such as tiles or concrete blocks. Not only are individuals carrying out such tasks at risk, but any workers on a construction site could be exposed to harmful RCS dust.

To ensure that its workers are protected from RCS dust, the construction company BAM Ireland tasked the team responsible for two large construction projects with carrying out a comprehensive assessment of the potential for exposure to RCS dust and identifying ways of addressing the risks. The team identified several areas of concern:

- **Traditional blockwork:** construction designs often involve blockwork with materials containing silica.
- **Coring and cutting of openings:** traditional, onsite coring and cutting techniques that produce RCS dust were used.
- **Tiling and cutting of tiles:** these activities produce large amounts of RCS dust in enclosed areas.
- **Suppression or extraction of dust:** when the production of RCS dust was unavoidable, techniques to suppress or extract the dust were inadequate or not used at all.
- **Personal protective equipment (PPE):** PPE was often not used correctly or at all.

Aims

To identify and implement measures to eliminate risks to construction workers from RCS dust.

What was done and how?

Changes were implemented following the hierarchy of prevention measures:

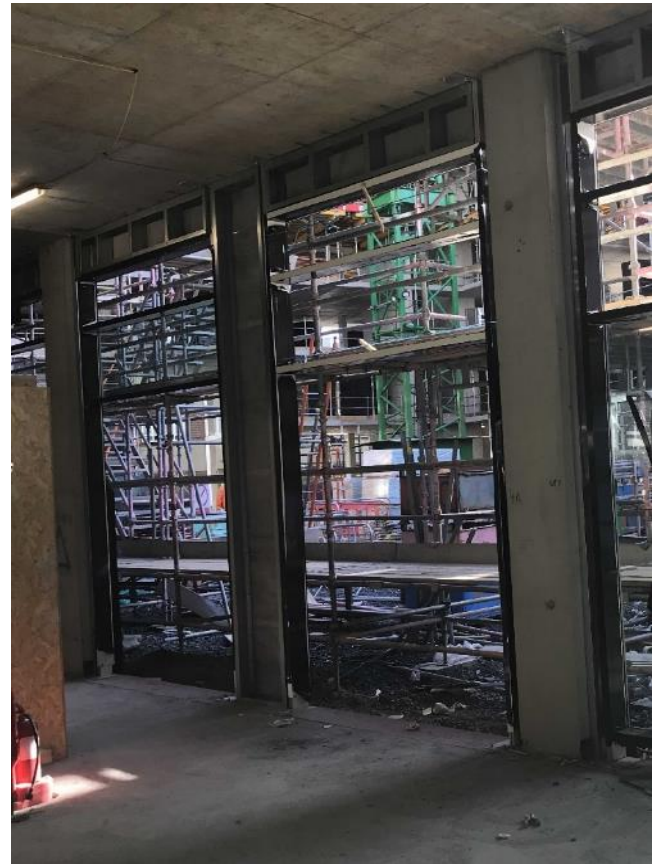
- **Elimination and substitution:** the project team worked closely with designers to identify construction solutions that do not involve silica. Silica-containing blockwork was replaced with Metsec walls (light-gauge metal infill walling) and plasterboard, and other dust-generating procedures were also replaced (for instance the use of MDF floors) to reduce general dust levels. Moreover, pod bathrooms, assembled in a controlled factory environment, were used, so no onsite tiling or grouting was required. Shot-fixing was used instead of overhead drilling, significantly reducing the amount of dust produced, and any units made of silica-containing materials were pre-cast, eliminating the need to cut into these materials on site. This pre-casting was informed by building information modelling, which allowed the project team to identify exactly where openings were required in concrete units. These adjustments to the traditional construction design significantly reduced the use of silica-containing materials and the need to carry out silica-generating activities on construction sites.
- **Technical control measures:** the company stipulated to sub-contractors at the procurement stage that RCS dust extraction methods should be used. A partnership with a manufacturer of professional tools for the construction industry enabled 95 % of sub-contractors to purchase extraction units for their tools. Other measures to minimise dust included vacuuming, water suppression and the covering of lorries.
- **Personal protection:** full face masks suitable for protection against RCS dust were provided. To ensure that these were used and fitted correctly, training was given and information boards explaining how to use them were placed at strategic locations on construction sites.

Training and awareness raising were critical to the success of the project. The issue of RCS dust was covered in online and site-specific induction materials, and further promoted on posters in canteens and on safety notice boards. The topic was also highlighted in toolbox talks — short safety discussions held daily before the start of shifts — and safety stand-downs, where normal work was paused so that everyone on the construction sites could focus on the risks posed by RCS dust and how to prevent them.

What was achieved?

The measures implemented substantially improved the work environment: less dust was produced, and improved housekeeping meant that any dust present was captured by extraction units or vacuuming. This also prevented RCS dust from collecting on workers'

skin and clothing. The measures also meant that less cleaning was required before handing the site over, thus reducing hand-over costs, and no complaints were received from neighbouring communities, which is very unusual for inner city construction projects of this size.



Source: BAM Ireland.

Success factors

The company implemented a variety of preventive measures prioritising elimination at the design stage and collective measures over personal protective measures to eliminate worker exposure to RCS dust. The approach taken was key to the success of the project:

- The initiative had support at all levels: from high-level management to the workforce on the ground.
- Cooperation with designers and the use of building information modelling at an early stage identified design features and materials that would eliminate onsite hazards from RCS and increase productivity.
- The partnership with a known tools manufacturer meant that sub-contractors could purchase high-quality extraction equipment for their tools at a favourable rate.
- Emphasising the topic of RCS dust at induction, on notice boards and through regular talks and

meetings meant that all contractors were aware of the policies and procedures in place to prevent risks, creating a culture of prevention.

- Compliance with safety measures was routinely monitored.

Transferability

RCS dust is a very common hazard on construction sites. The innovative approach taken by BAM Ireland is a good example to other large construction businesses and is likely to make a relevant contribution to improving safety and health conditions in the construction sector, not only in Ireland but also in other Member States.

Costs and benefits

The measures resulted in a cleaner work environment, eliminating exposure to RCS dust and benefiting worker health and well-being. Moreover, productivity increased, labour costs were reduced by 35 % and cleaning costs at project hand-over were 18 % below average.

Key features of good practice example

- Measures to eliminate worker exposure to RCS dust — a very common hazard on construction sites — were identified at the design stage of the project.
- The implementation of these measures led to real improvements in the work environment and an increase in productivity.
- The intervention had the full support of high-level management and workers and adds value to existing practices in the Member State.
- It is sustainable and fully transferable to other similar organisations in the construction section and to other countries.

Further information

Further information can be found at <https://www.bamireland.ie>



Source: BAM Ireland.

'The company implemented a range of innovative measures to eliminate worker exposure to harmful respirable crystalline silica dust, from the design stage to subcontractors.'