

WORK-RELATED ILL-HEALTH: Prevention

What are the issues?

Unmanaged health risks are a major problem in construction. Each year, 3700 people die from work-related cancers and many more from silicosis and other lung diseases. Industry is committed to tackling this. The Health in Construction Leadership Group, launched in January 2016, has a mission to 'eradicate the ill health and disease caused by exposures to health hazards on building sites.'ⁱ

This summary report, produced as part of our longitudinal research study, funded by IOSH,ⁱⁱ describes the practical measures in place on Tideway to address this.ⁱⁱⁱ It should be read alongside the 'Occupational health arrangements' report which outlines Tideway's overall approach to managing occupational health.

What was done?

The Tideway project is still at an early stage and this summary reports on progress to date.

Occupational Hygienists

Tideway has mandated the employment of occupational hygienists on the project and each MWC^{iv} is currently buying in 3-5 days of provision per week from a provider specified by Tideway. An occupational hygienist is a professional with expertise in the recognition, control and management of workplace health risks. They 'use science and engineering to control risks to health, by designing out hazards and applying engineering controls to reduce exposures to a minimum.'^v

Industry benefits and opportunities

- Occupational hygienists have an important role in preventing work related ill-health in construction
- Prevention of OH risks remains a management responsibility, managers need training and support to enable this
- Early intervention is important to design-out risks and embed the hierarchy of control. This is not always straightforward
- The Health Impact Frequency Rate (HIFR) could be employed by organisations and/or sectors across industry to provide a measure for occupational health
- OH training should be engaging and participative
- Wearable simulations of ill-health conditions (Loughborough's LUSKInS) are effective for worker training and designer appreciation.

Occupational hygienists on Tideway are working alongside other safety and occupational health professionals and managers to reduce work related risks. This report summarises three main areas where they are involved: design for health; health risk assessment and the health impact frequency rate measurement.

Design for health

The most effective means of reducing risks is to eliminate them at the design stage; before construction. This has been enshrined in the CDM (Construction, Design and Management)



regulations since the early 1990s^{vi} but these practices have not been widespread in the built environment to date.

Training in CDM and in 'healthy by design' is being provided to upskill designers on Tideway and encourage them to identify and design out risks. Residual health risks are entered into a Design Risk Register to support further risk management. Importantly this process considers all health risks that are identified during the design phase (i.e. before construction) and not just those for the designers to take action.



A Healthy by Design guide is being produced which gives designers and pre-construction planners specific examples of high hazard activities and how to design them out.

Some design and pre-construction changes have already been made or are ongoing to respond to identified health risks:

- To reduce worker exposure to diesel fumes, electrical and hybrid locomotives will be trialled in some parts of the project. However, health benefits will need to be considered against any increased safety hazards and operational issues.
- Replacing welded connections with bolted flanges to reduce the need for welding stainless steel and exposure to welding fumes along with the hot works safety risk.
- Opportunities to minimise dust exposure from the use of Sprayed Concrete Lining (SCL) are being explored from various perspectives.

Our ongoing research will monitor the impact of 'design for health' interventions, and how effective they are. We will also explore the barriers to designing-out health risks such as: designer skills, pre-construction planner skills, cost aspects, the availability of suitable alternatives, and the need to meet programme demands.

Health risk assessment

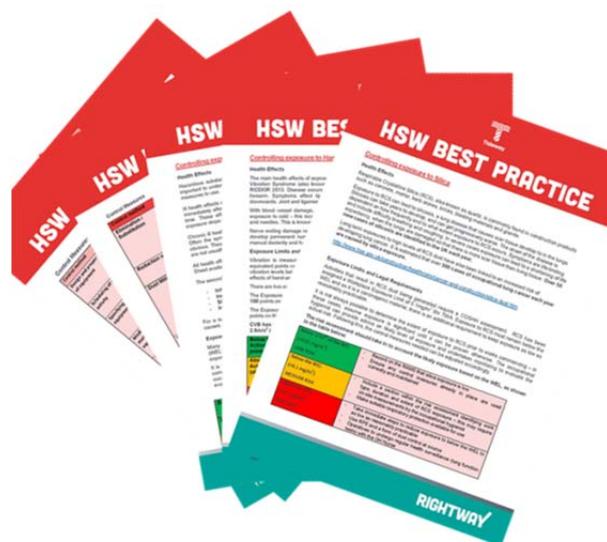
Risk Assessment and Method Statements (RAMS) are required for all work activities, and are completed by site managers, engineers and supervisors. They specify control measures to be used and any health surveillance or training needs which arise. A number of interventions support this including:

- A health risk register (HRR) for each project site, identifying the likely health risks from initial work, including site-related issues such as land contamination. These are being updated as the project progresses to identify the key hazards at each stage.

"Last week we found some contaminated land and immediately I could just go to the hygienist (who) provided a health risk assessment and the next morning he fed out to the guys what it was, how to make sure they protect themselves..... I'm really excited about what I could learn from him"

OSH professional

- Training is being provided by the hygienists in the MWCs for those who complete risk assessments.



Training is based on a series of Best Practice documents which outline the nature of the hazard (e.g. silica dust, wood dust, and vibration), the likely work exposures from particular tasks, and the control measures typically required.

- User-friendly pro forma documentation is being produced by the hygienists to support the risk assessment process
- Training is provided to workers to address the risks identified by the HRR and RAMS. Training is designed to be practical and engaging, as workers in construction typically favour learning by activities and involvement, and may struggle with 'PowerPoint' style training.

"We've spent a lot of time sitting in classrooms and doing courses. My job is to be out on site and working...I didn't want an office job"
Frontline worker



For example, the possible impact of lung disease is illustrated graphically using a set of pig's lungs modified to demonstrate various diseases.

Also, wearable simulations of ill-health conditions such as gloves to simulate HAVS or dermatitis (Loughborough's LUSKInS)^{vii} are being used across the project.^{viii}



Our ongoing longitudinal research will explore how health risk assessments work in practice as the project progresses and how they influence the control of health risks, particularly for frontline workers.

Health Impact Frequency Rate (HIFR)

The Health Impact Frequency Rate (HIFR) tool was initially designed and piloted during the construction of the Olympic Park for London 2012. It was planned as a means of 'counting' worker exposures to unmanaged health risks, e.g. how many workers exposed to dust are not using water suppression or wearing suitable Respiratory Protective Equipment (RPE) – in effect as a health equivalent of an Accident Frequency Rate (AFR).

The HIFR is assessed by an occupational hygienist on each project site over a two hour period each week. Findings are reported back to the local project team as well as to Tideway. They are also used to guide worker training. For example training on noise-related hearing loss is being provided, as the HIFR has identified several cases where workers have not been wearing the necessary hearing protection.

"We have a weekly visit...they do a health assessment on site, so they'll be onsite for a couple of hours just observing what's happening and then they score us, give us actions to do, so that's positive"
H&S professional

The HIFR tool has already been modified on Tideway to highlight examples of good and bad practice on site, to score these on a risk matrix, and to indicate where risk has been reduced by

the intervention of the occupational hygienist. Further development of the tool is envisaged to enable it to score examples of good practice as well as poor practice.

OH Site Record													
Location: <input type="text"/>	Contract No: <input type="text"/>												
Date: <input type="text" value="2"/>	Start Time on Site: <input type="text"/>												
Contractor: <input type="text"/>													
Time Left Site: <input type="text"/>													
Purpose of Visit: Occupational health review of works ongoing at the <input type="text"/> Site and HIFR.													
<table border="1"> <thead> <tr> <th colspan="4">Appraisal Rating</th> </tr> <tr> <th>Best Practice</th> <th>Good</th> <th>Acceptable</th> <th>Requires Improvement</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>X</td> <td></td> </tr> </tbody> </table>		Appraisal Rating				Best Practice	Good	Acceptable	Requires Improvement			X	
Appraisal Rating													
Best Practice	Good	Acceptable	Requires Improvement										
		X											
Summary of Visit													
1 During the site walk around there were two health hits observed on site. The weather during the site was overcast and dry. Both health hits observed were respiratory health hits. The first health hit was observed during the excavator clearing around the small muck bins. The scraping of the bucket on the floor was generating significant amounts of visible dust. This was rectified at the time of the walk around, an operative brought over the hose and dampened down the area before the excavator could carry on clearing the area.													
Risk rating during site visit: <input type="text" value="8"/>													
Actions Required: An operative retrieved a hose and dampened down the area before the excavator carried on clearing site.													
Risk rating after implementing actions: <input type="text" value="2"/>													
2 The second health hit observed was the site dust being generated from the concrete lorries moving on site. The main vehicle route on site that was causing the significant amount of dust, was the route adjacent to the fabricator's work bench. On the day of the site walk around there was a lot of vehicle activity on site with regards to concrete lorries. This was addressed by one operative, who dampened down the vehicle route the concrete lorries were taking.													
Risk rating during site visit: <input type="text" value="6"/>													
Actions Required: Operative dampening down vehicle route.													
Risk rating after implementing actions: <input type="text" value="2"/>													

The use of the HIFR is an exciting development as Tideway seeks to 'manage health like safety'. Our research will follow it through the project to see how it develops and how effective it is as a tool for improving health risk management.

What have we learnt?

There are significant, ongoing challenges for both Tideway and the broader industry.

Design for health, health risk assessment and HIFR are three of the processes which Tideway and the MWCs have put in place to protect workers from health risks. These measures rely on the expert skills of the occupational hygienists on the project. Their impact will only become apparent as the project progresses, and we will follow this with our research.

A key challenge for Tideway and the wider industry is to embed knowledge and ownership of health risk management in the management chain. For many managers and OSH professionals, Tideway is their first experience of working directly with occupational hygienists.

For more information visit <http://Tideway.Lboro.ac.uk> or email a.g.gibb@Lboro.ac.uk
 For more about Tideway visit www.Tideway.London
 Unless noted, all images ©Tideway

They are excited at being supported by experts, and there is a potential for them to see the management of workplace health risk as the responsibility of these professionals rather than the managers themselves.

A further important consideration will be the extent to which these measures can be embedded throughout the industry. Mega projects such as London 2012, Crossrail, Tideway and HS2 are working hard to prevent worker health risk at source. A critical part of their legacy will be whether their good practices can be transferred to other parts of the industry and smaller projects, and particularly to the SMEs which employ the majority of construction workers in the UK and Europe.

- ⁱ www.healthinconstruction.co.uk/
- ⁱⁱ The Institution of Occupational Safety and Health (IOSH) and Tideway are supporting the Loughborough longitudinal research to trace the effectiveness of HSW interventions throughout the Tideway project.
- ⁱⁱⁱ Summary authors: Jones W, Gibb AGF, Dainty ARJ, Haslam RA, Bust PD, Fuller P & Pinder J, Loughborough University (August 2017).
- ^{iv} MWC, or Main Works Contractor is the term used on Tideway for the Joint Venture Organisations (JVs).
- ^v www.bohs.org/protecting-workers-health/
- ^{vi} Our Loughborough team produced guidance for Design for Health (D4h) in 2003.
- ^{vii} Gibb AGF et al "Wearable simulations for ill-health conditions in construction", *Proceedings of the Institution of Civil Engineers - Civil Engineering*, 168:6, Thomas Telford Ltd, 2015. www.icevirtuallibrary.com/doi/10.1680/cien.14.00055
- ^{viii} The simulations pictured are already in use to a limited extent elsewhere in the industry. Prototype simulations of musculoskeletal disorders not previously used on construction projects are also being developed and trialled in collaboration with Tideway.



Loughborough University