

Safety by Design

Background

Many, if not all, incidents have causal factors rooted in early design decisions. SCSLG recognises this and promotes Safety by Design which is also a key theme in Highways England’s Home Safe and Well strategy.

The fast-growing BIM maturity of suppliers and advances in digital engineering capability are providing opportunities for step change improvements in Safety by Design. These are being enabled through enhanced, collaborative sharing using single source data and structured whole-life Health and Safety information in Common Data Environments.

Establishing Safety by Design as a mindset in project and programme teams, with everyone routinely reaching their decisions and developing actions to suit, is critical to achieving safer outcomes for workers and customers. The earlier this is done, from client-commissioning at the start of the design process, the greater the opportunities to ensure effective, whole-life risk management.

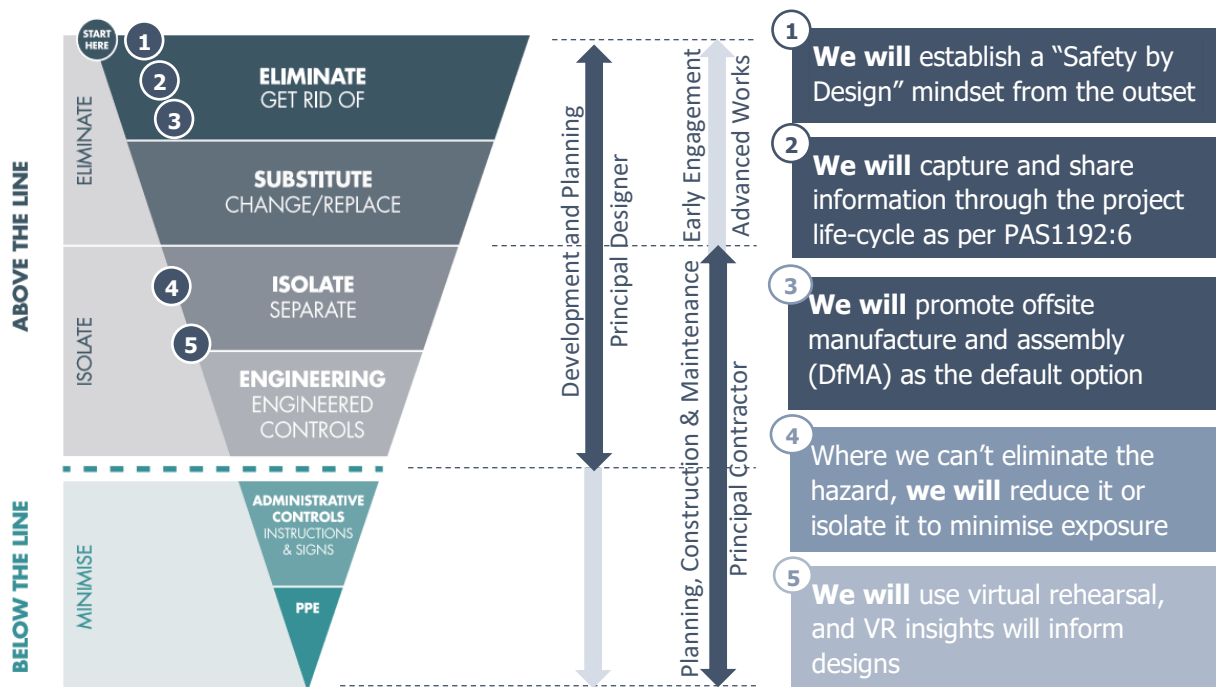
Vision

We want no harm to come to workers or customers as a result of our designs. In so doing we want to establish a lasting ‘Safety by Design’ culture from the concept stage of a project, including adopting a default mindset of designing for off-site manufacture and assembly.

Principles of Approach to be Adopted (including Application of Hierarchy of Control)

Overview

As a supplier community we have agreed to adopt the following approach as a **common standard**, following the General Principles of Prevention¹ and adopting a hierarchy of controls as described below, commencing from the earliest consideration of the design process. Necessary updates to current guidance, including RTB 26 ‘Whole life safety by design’, will be co-ordinated by **Highways Safety Hub**.



¹ The Management of Health and Safety at Work Regulations 1999, Schedule 1, General Principles of Prevention <http://www.legislation.gov.uk/ukxi/1999/3242/schedule/1/made>




The principles of this approach are:

1. **We will expect a Safety by Design mindset from the outset**, demonstrated through pro-active safety leadership and teamwork within an inclusive working environment. Approaches may vary but should include appropriate training/onboarding, with specific commitment to behaviours that effect safer designs outcomes, including evidencing consideration of operations and maintenance activities, and ongoing monitoring using leading performance indicators.
2. **We will capture and share information throughout the project life-cycle as per PAS1192:6**, using structured common data environments and data sets. We will increase the use of web-based 'project portals' as the primary means of access to project development work, including clear and intuitive frameworks for managing HS&W. Project portals will provide remote access to single-source information for all authorised parties including client, designers, contractors and temporary works designers. We will work with **Highways Safety Hub** to provide an accessible repository of case studies and best practice construction, operations and maintenance examples, including videos and virtual rehearsals, to educate design teams. We will engage the supply chain to facilitate active, industry wide take-up of this 'digital by default' approach and drive full life-cycle compliance. We will monitor handovers to ensure effective transfer of relevant design data without loss or duplication.
3. **Offsite manufacture and assembly will be promoted as the default construction assumption**. We recognise that the supply chain is evolving in this area in terms of standardisation, industry readiness, product availability and other aspects. Where practicable, we will design for offsite manufacture and assembly to eliminate several risks common to construction sites, whilst ensuring associated on-site assembly risks are managed effectively. Offsite preparatory solutions should also achieve better quality of product and reduce the duration of site activities on the network. Approaches not using either Design for Manufacture and Assembly (DfMA) or standardised solutions will be the exception and require appropriate senior designer sign-off.
4. **Where we can't eliminate risks, we will aim to reduce them or ultimately isolate them**. We will focus on the elimination of risk in the design phase wherever possible. We will actively engage with constructors, operators and maintainers, including clients, to understand contemporary capability and techniques to manage residual risk, which will positively influence our decisions to eliminate, reduce or isolate. Design models will predominantly be 3D+/4D-enabled and GIS based, updated continuously with all known hazards, and documented using a controlled Design Risk Management system for effective handover.
5. **We will foster virtual rehearsal as 'business as usual', with the ensuing insights informing our design development**. We will work collaboratively across designers, constructors, maintainers, operators and customers in order to better inform our design models for both permanent and temporary works solutions. We will plan to succeed safely and right-first-time on site through the use of digital models, for example to derive the benefits of virtual trial erection, full-scale mock-ups, etc., and to refine activity interfaces and eliminate potential clashes.

Additional Documentation/Detailed Guidance

- Principal Designers' Working Group proceedings: [Highways Safety Hub Principal Designers Working Group](#)
- Raising the Bar documents: [Raising the Bar Initiative](#)
- L153: [L153 Management of HSE in Construction \(CDM 2015\)](#)
- Specification for collaborative sharing and use of structured H&S information using BIM: [PAS-1192-6](#)
- Highways England's [Home Safe and Well Strategy 2019](#)

Document Approval Record

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