

Introduction

Our Safe By Design Building and Civils Working Group has developed an Aide Memoire for designers to embed the Life Saving Rules within Designs.

This Aide Memoire reflects the contributions of the Working Group including a number of workshop sessions with ideas and contributions from Network Rail Infrastructure Projects Engineering team, Consultant/Designers and Design and Build Contractors, i.e. across our industry.

The intent is that the Aide Memoire is used as one of the tools available during the design process to promote hazard identification and elimination and the reduction of risks using the Life Saving Rules.

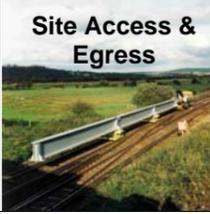
There are some key messages:

- Life Saving Rules are a key part of Network Rail's Safety Culture, i.e. they extend beyond a simple set of rules or control measures.
- They apply to everyone working on the railway or on railway projects.
- That includes the design community during the development of engineering designs.
- They guide our decision making and influence our behaviours.
- This Aide Memoire complements arrangements to identify hazards and manage risks demanded by various pieces of health and safety legislation.
- It is not a checklist.
- It is not exhaustive.
- It should be used to prompt discussions in design teams amongst designers around how the Life Saving Rules should be considered when preparing designs that are healthy and safe.

What do we Want?

The Buildings and Civils Group now wishes our participant companies and anyone else who prepares designs for railway projects to cascade this to their delivery teams and put it to work.

- We want your support to implement this
- We want design teams to have discussions on risk related design decisions that refer to Life Saving Rules and to capture those decisions.
- We want designers to use this Aide Memoire as part of their toolkit to prepare proposals that are healthy and safe.
- We want businesses to develop their own prompts and questions that are relevant to their design specialism.
- We want your feedback including lessons learnt from your efforts to develop and apply this.

WORKING RESPONSIBLY	 <i>“Always be sure the required plans and permits are in place, before you start a job or go on or near the line”</i>  <i>“Always use equipment that is fit for its intended purpose”</i>  <i>“Never undertake any job unless you have been trained and assessed as competent”</i>	 Site Access & Egress	<ul style="list-style-type: none"> Do you understand ALL the constraints of the site? Have you provided easy access for, and methods of, protection for all necessary parties – especially in junction and station areas? Have you considered access for all users, constructors, inspectors and maintainers with/without vehicles & plant? Is anyone isolated or vulnerable? Have you considered means of escape in an incident? Is there practical access for large components and plant e.g. cranes? Are bearings and joints readily accessible? Have you created unavoidable confined spaces e.g. in box girders?. Think about restricted spaces that influence the way tasks must be approached Is your design approved with Inter-disciplinary Design Check (IDC) close out? 		
		 Design Assurance	<ul style="list-style-type: none"> Does your design anticipate the need for temporary works design and is this communicated clearly? Has a TWC been appointed? Does your design provide all the project-specific information required for temporary works design by others? Have you achieved minimum maintenance requirements through the life cycle of the project? Have NR SDD’s been considered for your design and if applied have you checked their use is appropriate? Has the design been prepared and checked by competent engineers fully conversant with Safe by Design principles? Think also about BS5975 		
		 Site Lifting & Component Installations	<ul style="list-style-type: none"> Does your design indicate components weights, centres of gravity and suitable lifting points? Has the weight of components requiring lifting been considered and optimised? Is plant with adequate capacity known to be readily available to lift or move specified sizes of components in the time and space available? Are inspection and test plans robust and safe and convenient to enact at site? Does your design minimise the use of heavy plant in heavily serviced areas? Has manual handling been minimised by your design? 		
		 Site Operating Conditions	<ul style="list-style-type: none"> Does your design minimise the need for trackside access, protection and blockades? For construction AND maintenance? Does your design minimise noise and vibration during construction, operation, maintenance and demolition? Does your design affect signal sighting temporarily or permanently? Does your design avoid excavations (or demolition) that might destabilise the track-bed and if it can’t have you specified monitoring? Does your design minimise necessary work within excavations e.g. through prefabrication? Have you discussed maintenance activities with the maintainer to understand their needs and expectation? Does your design avoid heavily serviced areas? 		
		 Hazard Management	<ul style="list-style-type: none"> Has your design remit been challenged to eliminate hazards at the outset? Have you been provided with a comprehensive pre-construction information pack. If not, ask for information that you are entitled to receive. Has a Design Decision Log/Record been provided that records the thought process behind key decisions. Has a Hazard Log/Record and Risk Assessment been produced, with all sources? Has it been produced with good information and disseminated through project plans and permits? Are the hazards mitigated as far as possible? Have you achieved demonstrable closure or transfer/management to the site team? Is the Hazard Log/Record compatible with the Common Safety Method ? Are all significant residual risks CLEARLY highlighted on drawings using warning triangles? Has the emphasis of highlighted significant residual risks on drawings been ensured by avoiding the distraction from inclusion of “normal” risks? 		
		 Construction Materials & Components	<ul style="list-style-type: none"> Does your design allow sufficient time for curing of concrete? Do your steelwork design details allow comfortable access clearance for site erectors and welders, their tools and equipment? Does your design allow sufficient time and space for supply, delivery and erection of cladding? Have you avoided the use of hazardous substances? If not possible, have you explored COSHH? Does your design specifically identify components/assemblies that might be unstable in a temporary condition before completion? Does your design require temporary works that will impart load on the permanent works in the temporary condition? Is your design based on good information and a reliable interpretation of ground conditions? Have you illustrated a safe method of construction for your design and conducted a sense check on this? Are all proprietary components compatible with your design? 		
		 Information and Time	<ul style="list-style-type: none"> Has your design been informed by all necessary information, including ground conditions? Have any risks or uncertainty been communicated to all those who need to know? Has appropriate validated software been used for design under supervision of competent engineers with knowledgeable expectation of results? Has sufficient time been allowed for completion of design, construction planning and implementation at site? 		
		WORKING AT HEIGHT	 <i>“Always use a safety harness when working at height , unless other protection is in place”</i>	 Access to Height	<ul style="list-style-type: none"> Have you eliminated the requirement to work at height wherever possible? This includes opportunities for off site manufacture. If working at height still required during the asset’s life, does your design include protective devices e.g. handrails, fall arrest anchors, gantries etc? If working at height still required during the asset’s life, does your design utilise materials to minimise maintenance interventions? Does your design allow for additional loadings for access facilities including scaffolding? Does your design provide hard-standings at ground level for location and support of access facilities, e.g. MEWP, later? Does your design include components demountable for maintenance to avoid working at height including over tracks? Does your design allow maximised pre-assembly at ground level before lifting to height? Does your design allow safe access during construction as well as for maintenance? Does your design consider the opportunity to attach temporary edge protection or other access platforms before raising from ground level? Does your design have opportunity to mitigate the effects of falls, e.g. safety netting anchor points? Has every avenue been explored in your design to avoid high constructions e.g. by re-using existing assets? Does your design consider the use of remote inspection and testing? Can your bridge design avoid the use of bearings? If not provide safe and convenient access arrangements. Does your design clearly inform the end user of residual risks and the hierarchy of likely protection arrangements?
				Working over or near Water	<ul style="list-style-type: none"> Does the design eliminate the need to work over, or in, water whilst undertaking construction, inspection, maintenance and demolition? Have you considered the passage, accumulation and removal of debris or chemicals near water courses? Is there a flood risk from nearby rivers? Have you considered groundwater levels relative to excavations been considered? Including drainage?
		WORKING WITH MOVING EQUIPMENT	 <i>“Never enter the agreed exclusion zone, unless directed to by the person in charge”</i>	Plant & Equipment	<ul style="list-style-type: none"> Where moving parts or equipment have to be used, are isolation points available for maintenance purposes? Have you designed guards and signage at locations of lifts, hoists, escalators, gates and doors etc.? Have you considered people/plant interfaces within your design e.g. space and orientation of doors? Has your design agreed the plant required for a practical method of construction and recognised the impact of this on the rail infrastructure? Have you considered the possible imbalance of load during lifting of a component you have designed? Have you provided sufficient room for vehicles, cranes and other moving plant to operate safely on the area of your site? Are the ground conditions suitable for operation of heavy vehicles and plant at your site? Does your design clearly define the limits of proximity of vehicles, plant and personnel to vulnerable demolitions and excavations? Does your design recognise the need for components of temporary works to be moved in and out of positions? Is there space? Does your design recognise the risk of track settlement from plant loading and operation?
 Cranes, Hoists Transporting and Lifting	<ul style="list-style-type: none"> Has the design been checked so that it provides all of the statutory and site-specific clearances to electrical equipment? Has the design been checked so that these clearances are always likely to be present during construction even near temporary works? Has the temporary works design been checked so that it provides all of the statutory and site-specific clearances to electrical equipment? 				
WORKING WITH ELECTRICITY	 <i>“Always test before applying earths or straps”</i>  <i>“Never assume equipment is isolated – always test before touch”</i>	Clearances	<ul style="list-style-type: none"> Does your design incorporate all necessary earthing provisions? Does your design minimise requirements for earthing and bonding? Does it maximise separation and avoid conductive materials? Does your design recognise existing asset situations and conditions? Has the design been checked by a competent electrical person? 		
		Earthing and Bonding	<ul style="list-style-type: none"> Have you arranged for clearly marked isolation points? Have you designed for a remote isolation system? Have you considered how railway colleagues will test whether the system is isolated ? Have you provided good quality information for the Health and Safety File? 		
		Isolation	<ul style="list-style-type: none"> Are you competent? Do you have simple equipment layouts that are easy to understand with clear labelling of switches, equipment and accessible test points? Does the Pre-Construction Information Pack illustrate a clear understanding of existing assets? Have you arranged an effective Inter-Discipline Design Check with all disciplines at the earliest opportunity in design? Has a full services search been obtained including hand tag and trace and cable correlation? Is all this illustrated clearly on coordinated drawings? 		
		General			

What does your team think?

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		<p>Design Assurance</p> 	
		<p>Site Lifting & Component Installations</p> 	
		<p>Site Operating Conditions</p> 	
		<p>Hazard Management</p> 	
		<p>Construction Materials & Components</p> 	
		<p>Information and Time</p> 	
WORKING AT HEIGHT	 <p><i>"Always use a safety harness when working at height, unless other protection is in place"</i></p>	<p>Access to Height</p> 	
		<p>Working over or near Water</p>	
WORKING WITH MOVING EQUIPMENT	 <p><i>"Never enter the agreed exclusion zone, unless directed to by the person in charge"</i></p>	<p>Plant & Equipment</p>	
		<p>Cranes, Hoists Transporting and Lifting</p> 	
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		<p>General</p>	