

Introduction

Our Health and Safety 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 several workshop sessions with ideas and contributions from the Network Rail Capital Delivery Engineering team, Consultant/Designers and 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 existing standards and 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 is **not** a deliverable.
- 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.
- Although written with B&C in mind many points are equally applicable to other disciplines

Recommendations for use:







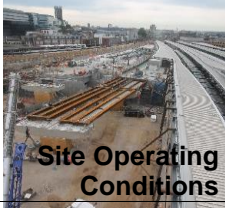









The Buildings and Civils Working Group members have trialled the application of this tool and provide the following guidance for use:

- This is a guidance tool for use in the Hazard Management process, is **not** a deliverable and is **not** intended as something to increase the workload of designers, but rather to assist them.
- The tool can be used at initial start-up meetings to help determine initial considerations and subsequently referred to through the design review process. Its use early in the design process is highly recommended.
- The aide memoire would be excellent to use as training and development material for less experienced designers.
- The aide memoire should be used to support and enhance effective communication and collaborative working.
- Designers should always take cognisance of the Principles of Prevention and refer to the ERIC principle.
- The aide memoire can be used as part of validation at IDC's to help record and drive Health and Safety by Design outcomes as design progresses,
- Other disciplines can use this as a basis to develop their own aide memoire.
- A third template sheet has been provided, should any project (or other discipline) wish to expand on the second sheet, which has purposefully been limited to one A3 sheet to allow printing.
- An alternative format in XL has been provided should this be preferred.

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 considered access point parking for personnel, plant, and equipment delivery, and how that will be protected from the public? • 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 including fire suppression and all temporary conditions? • Is there practical access for large components and plant e.g. cranes? Are proposals for site security secure from 3rd party access? • Are bearings, joints and means of access for maintenance readily accessible? Is the design maintainable whilst minimising trackworker access? • Have you created unavoidable confined spaces e.g. in box girders, UTX manholes etc? Have you minimised the creation of confined spaces? 	
		 Design Assurance	<ul style="list-style-type: none"> • Is your design approved with IDC, IDR, checks and all DRN comments closed prior to issue of AFC design? • Does your design anticipate the need for temporary works/staged works and is this communicated clearly via a schedule? Is a TWC appointed? • Does your design provide all the project-specific information required for temporary works design by others e.g. construction sequence? • Have you accounted for all PCI and have you completed any necessary further surveys, ground investigations etc to complete the design? • Have NR Standard Detailed Design's been considered for your design and if applied have you checked their use is appropriate? • Has the design been prepared & checked by competent engineers fully conversant with NTSN, RSSB & NR stds and H&Safety by Design principles? 	
		 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, compliant with the specification 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, e.g. by identifying materials and equipment for operation and maintenance? 	
		 Site Operating Conditions	<ul style="list-style-type: none"> • Does your design minimise the need for trackside access, protection and blockades, both for construction and maintenance? • Does your design minimise noise and vibration during construction, operation, maintenance and demolition? • Does your design affect signal sighting and/or comms equipment, 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, whilst designing to minimise the need for line blocks ? • Does your design minimise the need for trackside access, protection and blockades, both for construction and maintenance? 	
		 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 comprehensive Pre-Construction Information? 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 & updated, with all sources, for CSM and CDM, disseminated through project plans? • Are the hazards eliminated or mitigated as far as possible? Have you achieved demonstrable closure or transfer/management to the relevant team? e.g designs to implementations, handover to maintenance and staged transitions • Is the Hazard Log/Record compatible with the Common Safety Method? 	
		 Construction Materials & Components	<ul style="list-style-type: none"> • Are all significant residual risks CLEARLY highlighted on drawings e.g. using warning triangles? • Has the emphasis of highlighted significant residual risks on drawings been ensured by avoiding the distraction from inclusion of “normal” risks? • Does your design allow sufficient material strength and time for striking formwork, advancing construction and curing of concrete? • Do your steelwork design details allow prefabrication, 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 e.g. mining risks? 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? 	
		 <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 on existing and new structures for access facilities including scaffolding? • Does your design provide hard-standings at ground level for location and support of access facilities, e.g. MEWP, tower scaffolds? • 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, with any necessary signage to warn of residual hazards? • 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 use of remote inspection/testing, or any parts that could be raised or lowered from ground level/safe location? • 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 access/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 de-construction? • Have you considered the passage, accumulation and removal of debris or chemicals near water courses, e.g. measures to prevent contamination? • Is there a flood risk from nearby rivers/sea? Has design incorporated provision for safe maintenance? Could contaminated water affect the works? • Have you considered groundwater levels relative to excavations been considered? Including drainage? 	
		 <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 must be used, are isolation points available for maintenance & is there a safe accessible means of isolation? • Have you designed guards and signage at locations of lifts, hoists, etc.? Is the equipment suitable for the environmental conditions in use? • Have you considered people/plant interfaces within your design e.g. space and orientation of doors & is cable management adequate? • 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/centre of gravity during transport and lifting of a component you have designed? • Is there sufficient room for vehicles, cranes and other moving plant to operate safely on the site? Does design accommodate existing services? • Are the ground/floor conditions suitable and able to support the operation of heavy vehicles/lifting plant and proposed loads; working platforms? • 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 operations?
 <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"> • Has the design been checked so that it provides all of the statutory and site-specific clearances to electrical equipment above and below ground? • 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 the statutory and site-specific clearances to electrical equipment? 		
 Earthing and Bonding	<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? 			
 Isolation	<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, accurate information for the Health and Safety File, e.g. as-constructed drawings which are as-constructed? 			
 General	<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 (PCI) illustrate a clear understanding of ALL existing assets including location and condition? • Have you arranged an effective Inter-Disciplinary 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? 			

Project Title:

Date:

WORKING RESPONSIBLY	 "Always be sure the required plans and permits are in place, before you start a job or go on or near the line"  "Always use equipment that is fit for its intended purpose"  "Never undertake any job unless you have been trained and assessed as competent"	Site Access & Egress 	
		Design Assurance 	
		Site Lifting & Component Installations 	
		Site Operating Conditions 	
		Hazard Management 	
		Construction Materials & Components 	
		Information and Time 	
WORKING AT HEIGHT	 "Always use a safety harness when working at height, unless other protection is in place"	Access to Height 	
		Working over or near Water	
WORKING WITH MOVING EQUIPMENT	 "Never enter the agreed exclusion zone, unless directed to by the person in charge"	Plant & Equipment	
		Cranes, Hoists Transporting and Lifting 	
WORKING WITH ELECTRICITY	 "Always test before applying earths or straps"  "Never assume equipment is isolated – always test before touch"	Clearances	
		Earthing and Bonding	
		Isolation	
		General	