

Design Stage 'Hazard Awareness and Risk Identification' Checklist (HARI)			
Project Number	150457	Key to status of design	RAG
Location	Carn Gwaval, Isles of Scilly	Risk tolerable	RM/RR
Building Type & Description	Nursery Extension and New Build Social Care Building	Risk to be further reviewed or agreed	
Date of Preparation	19.12.2016	Risk not tolerable	
Date & Type of Review		Risk review pending or N/A	
<p>RM – Risk mitigated indicates that the risks have been assessed and are judged to be no more significant or unusual than a capable contractor would be expected to manage or to be aware of, or that mitigation measures have been included in the specification drawings.</p> <p>RR – Residual risk has been identified and considered tolerable in relation to the concept design intent that cannot be designed out.</p>			
Hazard Awareness and Risk Identification Checklist (HARI)			
Risk	Designers to identify and consider the following significant risks and other factors – SFARP	Comments, Actions, References	RAG Colour
A	Catastrophic risks – site specific and generic		
Structural Collapse	<ul style="list-style-type: none"> - Existing and adjacent buildings, structures, party walls, retaining walls, etc. during construction and permanent condition - Underground voids such as tunnels, vaults, mines, old workings, wells, etc. - Existing fabric of buildings during refurbishments under temporary loadings of scaffolding, materials or plant - Construction cranes, scaffolding or trees in poor condition falling in high winds - Temporary works, including all types of scaffolding, shoring, propping. Ensure temporary works designer and coordinator appointed. 	RR834 – preventing catastrophic risks in construction CIRIA Publication C699 – Guidance on catastrophic events in construction BS 5975:2008 – Code of practice for temporary works procedures and the permissible stress design of false work	
Fire	<ul style="list-style-type: none"> - Fire during construction – means of escape for operatives (e.g. stairs, routes) and existing occupants (if in use). Access for fire-fighting appliances and personnel - Temporary fire protection to prevent fire spread to adjacent properties in construction phase, e.g. timber frame protection and unprotected area calculations 	HSG168 – Fire safety in construction UKTFA (STA) guidance on fire spread	
Water	<ul style="list-style-type: none"> - Rivers, canals, culverts, storm drains on site or adjacent - Temporary/permanent railing as an early activity - Contractor to issue a safe system of work after seeking further advice, including consideration of lifejackets, throw-lines, torpedo floats and grab rings, floatation devices, rescue and safety harnesses, rescue boats, communications to raise alarm - This should ensure that there is an adequate method of preventing falls on to the mud or into the river and for retrieving persons. - Identify flooding risks – occupier may need to join the Environment Agency Flood Warning System and establish an evacuation procedure - Stagnant water from rivers, canals, culverts, drains. Risk of contamination to watercourses by spills on site. Infection/Weil's disease. 	Reference to HSE prosecution of the Environment Agency, following a fatal accident on the banks of the River Witham on 12 th September 2001	

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Wind or extreme weather	<ul style="list-style-type: none"> - Identify likelihood of extreme weather conditions on site in long and short term which may influence the design and construction methodology. 		
B	Significant risks – site specific		
Noise, vibration and disturbance to neighbours	<p>To occupied buildings and housing nearby, hospitals, churches, cemeteries, schools, care homes, etc.</p> <ul style="list-style-type: none"> - Piling operations – hammered/driven or augered? Noise disturbance or damage to surrounding buildings. - Risk of disturbing those in vulnerable sectors of the community - Limits on hours of site work 		
Health and respiratory injuries from materials and dust	<p>To local environment, all neighbours, operatives, and site personnel</p> <ul style="list-style-type: none"> - Identify asbestos materials and other contaminants in existing buildings, e.g. horsehair plaster - Ensure adequate surveys and appropriate contractors used to identify dangerous materials on site and/or their removal - Avoid or minimise chasing, cutting blocks and masonry etc., unless procedures in place for dust suppression or vacuum extraction, or enclosure and extraction. - Demolitions and concrete breaking – minimise works and damping down processes - Avoidance of screed removals where possible - Lead paint in existing buildings – avoidance of dry sanding, drilling or cutting. Surveys may be necessary 	<i>L143 – Managing and working with asbestos Control of Asbestos Regulations 2012</i>	
Site access and construction facilities	<ul style="list-style-type: none"> - Surrounding roads and access roads to be considered for safe access and egress of staff, materials and waste. Low or weak bridges, narrow roads, overhanging trees or cables, etc. - Welfare facilities to be considered in terms of location, services, and convenience of contractors and existing users. Phasing of facilities as project progresses to be considered - Materials unloading and waste storage areas to be considered - Static and mobile crane sizes, locations, weights and access to be considered in principal, away from possible vehicle impacts, and collapse on occupied premises where possible - Consider location, convenience and security of construction team vehicular parking, materials and tools storage facilities. 	<i>HSG150 – Health and safety in construction</i>	
Project phasing	<ul style="list-style-type: none"> - Location of existing buildings, car parks and roads to be considered in relation to temporary and future site arrangements in terms of cost, convenience and safety - Transient delivery or collection locations and times, such as school runs or food deliveries during construction period 		
C	Significant risks – site generic		
Electrical interference to radio equipment	<ul style="list-style-type: none"> - Interference with neighbouring hospitals, ambulance stations, airport - Specify no site radios where safety is critical 	<i>This is subject to site-specific risk assessment by PC</i>	
Injury to trespassers	<ul style="list-style-type: none"> - Hoarding to/fencing-off of site and deep excavations - Security measures to scaffolding, detectors, CCTV 		
Animals vegetation, poisonous bites	<ul style="list-style-type: none"> - Consider risk of adders, hornets and wasps' nests from adjacent sites - Aggressive seagulls or other birds, particularly during nesting season - Consider bats, birds, newts and other fauna with regard to the breeding seasons and relocations 	<i>These environmental safety issues are included in BREEAM requirements but are part of an ethical and criminal</i>	

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	<ul style="list-style-type: none"> - Consider poisonous or aggressive vegetation such as Japanese knotweed that can take considerable time to eradicate, or cause significant damage if ignored. - Consider tree roots and avoidance of killing trees during construction and causing structural damage to permanent structures 	<i>requirement to protect endangered and other species from harm. Some can also harm operatives and users. Identification is the key</i>	
Injury to pedestrians	<ul style="list-style-type: none"> - Rights of way adjacent to or across site. Temporary closures - Adjacent railways - Pavements – protecting the public and materials 		
Electric Shock	<ul style="list-style-type: none"> - Cables, street lighting, even if assumed disused 	<i>BSI PAS 128 Specification for underground utility detection, verification and location</i>	
Falls on slopes	<ul style="list-style-type: none"> - Identify steep falls, slopes and embankments which can increase site access costs and difficulties during construction and maintenance 		
D	Existing services and utilities		
Stomach infection	<ul style="list-style-type: none"> - Water supplies potable? Water quality tested? 		
Fire	<ul style="list-style-type: none"> - Water supply/hydrants available for construction fire use 		
Electric shock	<ul style="list-style-type: none"> - Overhead cables – barriers specified - Underground cables – investigation to confirm position as survey drawing and utility company information. Identify possibility of unknown live services. Further surveys and hand digging likely to be required - Cables assumed disused, to be identified and checked 	<i>BSI PAS 128 Specification for underground utility detection, verification and location</i>	
Explosion	<ul style="list-style-type: none"> - Gas pipes – investigation to confirm position as survey drawing and utility company information. Identify possibility of unknown live services. Further surveys and hand digging - Propane cylinders 	<i>BSI PAS 128 Specification for underground utility detection, verification and location</i>	
Uncertainty	<ul style="list-style-type: none"> - Surveys of utilities are not totally reliable. On-site checks to be made 	<i>BSI PAS 128 Specification for underground utility detection, verification and location</i>	
Excavation	<ul style="list-style-type: none"> - Encourage use of vacuum excavation equipment in proximity of dangerous or multiple utilities locations 		
E	Contamination and buried objects		
Contamination	<ul style="list-style-type: none"> - Buried tanks/petrol interceptors - Purging or chemical cleaning of existing services 		
Explosion	<ul style="list-style-type: none"> - Buried ordnance – check local authority records and bomb maps, or obtain a survey. Site detection/probing methods may be necessary prior to excavations - Methane and other ground gases risk 		
Musculoskeletal injuries	<ul style="list-style-type: none"> - Identify particularly heavy objects or ones that are difficult to handle, remove or break up 		
F	Working space/working platforms		
Falls from height	<ul style="list-style-type: none"> - Design to allow early installation of permanent floors, edge protection and guarding to holes and penetrations, Fixing holes for edge protection - Allow for work to be carried out at ground level or from permanent floor levels where possible 		

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Manual handling/musculoskeletal injuries	<ul style="list-style-type: none"> - Avoid site layouts or dictating construction methods that limit space for access where reasonably practicable - Consider type of access platforms, scaffolds and mechanical lifting aids that are appropriate for the design to be constructed and maintained 		
Fire/emergency evacuation	<ul style="list-style-type: none"> - Design for early installation of stairs and fire compartments where possible. Prefabrication can assist this process 		
G	Confined spaces		
Entry into confined spaces	<ul style="list-style-type: none"> - Silos, sewers, ductwork, unventilated rooms, storage tanks, basements, etc. - Avoid creating confined spaces where possible - Minimise operations involving hazards in confined spaces, e.g. welding, cutting, etc. - Minimise work in basements and the need for deep trenches 	<i>If confined spaces are essential avoid the need for access or consider safe methods of use.</i>	
Lack of oxygen/poisonous gases (including from residues left)	<ul style="list-style-type: none"> - Avoid creating, and minimise operations involving, hazards in confined spaces where possible - Avoid entry to confined spaces where possible. If entry is unavoidable, follow a safe system of work and put in place adequate emergency arrangements before work starts - Provision of ventilation and testing the air - Provision of breathing apparatus - Permit to work scheme 	<i>L101 Safe work in confined spaces. Confined spaces Regulations 2007</i>	
Drowning	<p>Due to liquids and solids that can suddenly fill the space</p> <ul style="list-style-type: none"> - Rescue harnesses and lifelines - Communications to raise alarm 		
Fire and explosion	<ul style="list-style-type: none"> - Check size of emergency exits - Non-sparking tools and 25V max. equipment 		
Noxious fumes	<ul style="list-style-type: none"> - Avoid specifying applied finishes in confined spaces where possible - Avoid specifying hazardous materials/substances for application in confined spaces 		
H	Erecting structures		
	Steelwork, in-situ reinforced concrete, pre-cast reinforced concrete, pre-stressed concrete, timber, masonry, brickwork, blockwork, roof structures, stairs		
Collapse/temporary instability	<ul style="list-style-type: none"> - Avoid designs which involve temporary instability during construction or specify erection sequence including details of temporary support measures required - Temporary props and bracing – high winds 		
Falls from height	<ul style="list-style-type: none"> - Maximise pre-fabrications, pre-casting, use of simple intrinsically safe connection details, and allow for early installation of floors, roof decks, stairs, edge protection, etc. to minimise risk from high level working - Details to allow easy connection of safety lines, harnesses etc. - Specify easily achievable tolerances where possible 	<i>BS 8560 Code of practice for the design of buildings incorporating safe work at height</i>	
Collapse – Construction loadings	<ul style="list-style-type: none"> - Identify construction loadings on drawings together with any temporary support requirements, e.g. high walls, unbraced structures - Provide adequate tender information 		

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Manual handling/musculoskeletal injuries	<ul style="list-style-type: none"> - Heavy blocks/stone section/windows components/lintels and window sills – lifting hooks/component size – under 20kg 		
Handling major components	<ul style="list-style-type: none"> - Consider access, storage, erection procedures and lifting details for large or awkwardly shaped components - Consider composite roof panels for easier handling in high winds 		
Falling materials	<ul style="list-style-type: none"> - Design temporary works to avoid falling materials - Tethering of tools to be recommended 		
J	Materials/substances/components generally		
Manual handling/musculoskeletal injuries	<ul style="list-style-type: none"> - Design to allow mechanical handling where possible (avoid blocks weighing over 20kg, e.g. 90mm blocks) - Ensure unit weights and sizes of materials are reduced to acceptable levels where manual handling is unavoidable - Specify easily achievable tolerances where possible - Specify lifting hooks (e.g. coping stones, large masonry items) 		
Cuts and abrasions	<ul style="list-style-type: none"> - Avoid specifying materials and components with sharp edges, corners, etc. where reasonably practicable 	<i>This is more of a trade capability and training issue, e.g. using brick tiles</i>	
Carcinogenic diseases	<ul style="list-style-type: none"> - Avoid specification of unknown carcinogenic materials and substances - Where no alternatives, ensure that adequate information is available at tender stage 		
Injury to eyes	<ul style="list-style-type: none"> - Operations involving splashing 		
Respiratory injuries	<ul style="list-style-type: none"> - Avoid specifying materials and substances which are likely to cause respiratory problems where possible, e.g. epoxies - Design to avoid cutting, chasing, etc. 		
Skin diseases	<ul style="list-style-type: none"> - Avoid specifying materials and substances which are likely to cause skin diseases (e.g. dermatitis) where possible; protective clothing necessary for cement and lime mortars 	<i>Protection against exposure to wet cement and mortar is a trade issue</i>	
K	Cladding/glazing		
	Flat roof work, pitched roof work, masonry, brickwork, blockwork, stonework, panels, windows, patent glazing, sheeting, tiling, slating		
Temporary instability	<ul style="list-style-type: none"> - Avoid designs which involve temporary instability during construction, or specify an erection sequence that avoids it. If unavoidable, detail temporary support measures required - Temporary fixing of windows/curtain walling balustrades and guard rails 	<i>This may be a specialist subcontractor designer issue</i>	
Falls from height	<ul style="list-style-type: none"> - Maximise prefabrication, adopt simple details and allow for early installation of floors, roof decks, stairs, parapets, permanent edge protection etc. to minimise risk from high level working - Specify easily achievable tolerances where possible - Detail to allow easy connection of safety lines, harnesses etc. where necessary - Use large decking, cladding panels, domed roof lights - Consider future maintenance and cleaning, especially balconies - Consider window cleaning from inside where possible - Consider permanent access and fastenings 		

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	<ul style="list-style-type: none"> - Consider appropriate type of temporary and permanent edge protection to roofs - Window restrictors, handle accessibility, sill heights and guarding - Consider heights of balustrading where publicly accessible, or where seating is provided adjacent (e.g. food courts) 		
Construction loadings	<ul style="list-style-type: none"> - Identify construction loadings on drawings for mechanical installation plant and temporary works allowances and stacking of materials 		
Falls through fragile materials	<ul style="list-style-type: none"> - Avoid specifying fragile materials (e.g. roof-light panels) - Consider installation, fragility and glazing of roof lights - Provide guard rails around roof lights or raise up 		
Falling objects	<ul style="list-style-type: none"> - Ensure adequate lifting provisions on components - Maximise prefabrication - Safe access for future maintenance and cleaning of facades - Review specification for temporary fixing of windows/curtain walls to avoid being blown out by gusts of wind before being permanently fixed (cause of two PI notifications) - Design out complex fixing details of large elements at high level with small components - Ensure no gaps in balustrading where objects can pass through above public areas, e.g. atria, transport hubs, etc. - Advise contractor of need to tether tools, elements and materials, where working above others 	BS 8560	
Fire	<ul style="list-style-type: none"> - Specify non- or low-flammable and non-combustible materials and products where possible - Consider the end use of the building, e.g. kitchen, and check with the clients building insurers for extra requirements - Consider escape from roofs in a fire 		
L	Furniture, finishes and equipment Stone, ceramics, coatings, paints, sealants, adhesives, wood, wood-based materials, synthetic materials		
Hazardous materials/substances	<ul style="list-style-type: none"> - Avoid specifying finishes involving hazardous materials/substances where reasonably practicable - Substitute safer alternatives - Specify pre-finished components where reasonably practicable 		
Dust/fumes	<ul style="list-style-type: none"> - Avoid specifying surface preparation, application methods and processes likely to release hazardous dust or fumes where reasonably practicable, i.e. cutting, drilling, abrading, polishing, etc. (e.g. with solvent paints, adhesives and spray paints) - Avoid dust from creating site-mixed powder materials 		
Noise/vibration	<ul style="list-style-type: none"> - Avoid specifying finishes requiring use of vibrator tools or noisy equipment for surface preparation or application methods where reasonably practicable 		
Fire	<ul style="list-style-type: none"> - Avoid specifying materials using inflammable solvents 		
Musculoskeletal injuries	<ul style="list-style-type: none"> - Size of furniture and components such as glass screens, reception desks, sliding folding partitions to be considered in terms of vertical access via goods lifts, hoists or at last resort stairs if of man-handle able size. Horizontal access also to be considered e.g. trolleys, skates, etc. 		
M	Risks to building users and visitors		
Crushing	<ul style="list-style-type: none"> - Escape routes from loading bays - Protection of pedestrians from vehicular routes 		

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	<ul style="list-style-type: none"> - Boundary walls designed to fall away from railway tracks, roads, playgrounds and pedestrian areas - Vehicle barriers to prevent runaway cars falling from height in icy conditions or where driver loses control 		
Drowning	<ul style="list-style-type: none"> - Hazard warning signs to be provided, e.g. 'Danger Sudden Drop'. Life buoys? - Railings to be 1.1m high and difficult to climb. Designed to resist impact by vehicles - Whoever takes responsibility for the maintenance of river walks is to take the decision as to the appropriate level of protection to meet the duty of care requirement to health and safety legislation. They must also put into place a management plan for the maintenance of such protection 		
Fire	<ul style="list-style-type: none"> - Escape for deaf or hearing-impaired people, particularly in public buildings – consider vibrating alerts or visual alarms - Consider evacuation as well as access and advise employers/tenants of their duty to provide a suitable evacuation strategy for a wide range of users and to carry out fire risk assessments 	<i>These should be included in the Fire and Inclusive Design Strategies under parts B&M of the Building Regulations</i>	
Collision/trapping	<ul style="list-style-type: none"> - Automatic doors – risk assessment to BS 7036 - Automatic gates – Gate Safe to be referenced 	<i>BS 7036 Code of practice for safety at powered doors for pedestrian use Gate Safe32</i>	
Falls from height	<ul style="list-style-type: none"> - Operation of high-level blinds - Window controls as Part N, less than 1700/1900mm above floor level - Fixing to be provided for ladders more than 6m long - Horizontal force on balustrades specified as appropriate for use, e.g. public use – refer to AD K - 100mm gaps between balustrades if children under 5 are likely to be present - Glass balustrades and full-height glazing at height – consider risk if toughened glass shattered - Safety glazing to Part N and BS 6262 - Restrictors and stays to opening windows to prevent accidental falls and children climbing out - Ability to attach safety harnesses to gantries and walkways, and anchor lines - Guarding to level changes, riverbanks, ditches, stairs, under-stair soffits, ramps 	<i>BS 8560 Code of practice for the design of buildings incorporating safe work at height30 Building Regulations Approved Document N & AIF Information Building Regulations, Approved Document K33</i>	
Musculoskeletal injuries	<ul style="list-style-type: none"> - Outward-opening doors and windows – walking into leading edges, especially at head height 		
Burns/scalding	<ul style="list-style-type: none"> - Low surface temperature radiators where toddlers or elderly may be present. Also avoid unprotected pipework - Flue outlets located away from public areas or protected 		
Drowning	<ul style="list-style-type: none"> - Full risk assessment, particularly for unsupervised pools - River walkways etc. 		
Safe by Design/rape/attack	<ul style="list-style-type: none"> - Consider personal safety and sense of safety - Advice of crime prevention officer or guidance to be sought - Good surveillance, lighting, minimisation and recesses 	<i>Safe by Design, Local Crime Prevention Officers, BREEAM26 advantages</i>	
Slips/falls/breaks and bruising	<ul style="list-style-type: none"> - Slip resistance of floors specified to entrance, corridors, swimming pools and sanitary accommodation, especially in wet conditions. Entrance mat wells and slip resistance research related to cleaning materials used - Good extraction ventilation to kitchens, bathrooms and swimming pools - Undulations and paving trip hazards 	<i>HSE Slips assessment tool www.hse.gov.uk/SLIPS/sat/index.htm</i>	

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	<ul style="list-style-type: none"> - Guarding against falls in level, steep slopes - Stair and step nosings in contrasting colour with good lighting, including to external stairs and fire escapes - Protection to features that may attract children, e.g. skateboard ramps, features to climb 		
N	Maintenance/repairs		
Falls from height	<ul style="list-style-type: none"> - Consider ease of replacement of light bulbs, especially above stairs or in high spaces, atria, etc. - Design in adequate safe systems of access, edge protection, provision for the attachment of safety equipment, eyebolts, rails etc. where necessary - Base for ladders provided as in Approved Document N - Position controls, valves and equipment requiring regular maintenance at low level or (lowerable) - Low-maintenance equipment/fittings where practicable - Design process followed to select suitable man safe/Latchways system if no alternative. Harnesses and training for use included in specification - Cat ladders and walkways designed to Building Regulations and relevant BS - Handrails to be specified near lift-up access hatches 	<i>Provide information regarding built-in safety facilities, etc. in H&S file/maintenance manual</i>	
Falls	<ul style="list-style-type: none"> - Steep slopes, including landscape maintenance 		
Falls through fragile materials	<ul style="list-style-type: none"> - Avoid specifying fragile materials where possible, but may exist - Design in adequate safe systems of access, edge protection, provisions for the attachment of safety equipment, etc. where necessary 	<i>Provide information regarding built-in safety facilities, etc. in H&S file/maintenance manual</i>	
Electrocution/scalds	<ul style="list-style-type: none"> - Provide adequate isolation facilities for all plant and equipment 		
Manual handling/musculoskeletal	<ul style="list-style-type: none"> - Design components for ease of handling and replacement - Provide adequate access facilities, working space and lifting facilities around all plant and equipment where necessary - Large roof hatches with hydraulic or mechanical assistance to open and close 	<i>Provide information regarding built-in safety facilities, etc. in H&S file/maintenance manual</i>	
Hazardous materials/substances	<ul style="list-style-type: none"> - Avoid hazardous materials and substances - Provide information on existing or unavoidable hazardous materials or substances, e.g. asbestos, lead paint 		
P	Dismantling/demolition/future alteration/refurbishment		
Uncontrolled collapse	<ul style="list-style-type: none"> - Provide information regarding design parameters, design loadings, means of ensuring structural stability, construction details, specific alteration/demolition hazards (i.e. pre-stressing, suspension, cantilevers etc.) 	<i>Designers do not need to tell demolition professionals how to demolish all buildings, only identify significant risks</i>	