DESIGN RISK ASSESSMENT

Client Details:	Christ the King Catholic Voluntary Academy, Glenfield Rd, Leicester LE3 6DF
Project Details:	Replacement of Windows & Doors
Job Ref:	J4804
Designer Details:	YMD Boon Limited, 6b Compass Point Business Park, Market Harborough. LE16 9HW
Date of Issue:	23rd July 2021

This document shall be completed to cover each element of the design that is the responsibility of the aforementioned Designer. This shall retain focus on elimination of any inherent risks within this design process, so far as is reasonably practicable. Ongoing design reviews are intended to provide critical analysis to ensure the design is suitable, and which subsequently may result in no requirement for a DRA. Where residual risks remain, recommendations will be made to support the installation, general use, maintenance, final decommissioning and/or demolition of the design. It is reasonable for the Designer to assume that all persons appointed to support the Client in any of the aforementioned stages, will have been assessed for suitable levels of competency prior to any commencement.

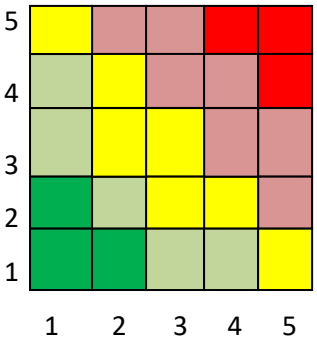
The Design Risk Register has been completed by the Designer, to provide a perspective of considerations made during the design preparation. In accordance with The Construction (Design & Management) Regulations 2015, it is deemed reasonable that unforeseeable hazards have not been considered during this process and/or trivial risk.

The following documentation has been taken into account by the Designer, prior to issue of this document:	
The Management of H&S at Work Regs 1999	L135 L Series Guidance CDMR 2015
The Health and Safety at Work Act 1974	HSG150: H&S in Construction
The Workplace (Health, Safety and Welfare) Regulations 1992	**BS5975:2008** Code of practice for temporary works procedures and the permissible stress design of false work
The Construction (Design & Management) Regs 2015	
The Work at Height Regulations 2005	HSE: 5 Steps to Risk Assessment
This list is not exhaustive	*This list is not exhaustive*

The key below provides a risk rating guide for other duty holders and the Client to review as part of the design verification process.

Key:
The final risk rating, is calculate by considering the likelihood of a hazardous event occurring and the severity of this event. Therefore in order to assess the risk of the individual hazards involved in the activity, a simple calculation should be made:

Final Risk Rating = Likelihood x Severity



Likelihood of harm:
1 = Very unlikely
2 = Unlikely
3 = Fairly likely
4 = Likely
5 = Very likely

Severity of harm:
1 = Insignificant no lost time
2 = Minor
3 = Moderate – up to 7 days, lost
4 = Major – 7 days plus, lost
5 = Catastrophic – leading to death or specified injury

The above matrix demonstrates that:-

Green = acceptable
Yellow = tolerable, but improvement should be considered
Red = unacceptable and no works should continue until control measures have been reviewed

DESIGN RISK REGISTER

Ref	Task/Activity	Period/Work Stage	Hazard	Risk Rating			Design Control Measures Taken
1.	Construction Access	Action Required	Construction Traffic and pedestrians. Visitors to and from site and staffing routines	4	2	8	Isolate and secure construction route. Establish route in to site area; use appropriate warning signage for plant and vehicle routes. Secure / maintain all site areas within Heras fencing and appropriate warning signage temporary route for staff to be established
2.	Construction site establishment for Contractors / school staff and all pedestrians on foot. Defined routes for drop off and collection points.	Pre Construction Information	Live site – danger to school.	2	2	4	Isolate and secure construction route. Use trained banks person
3.	Deliveries to site	General	Lifting (Muscular)	2	3	6	Use good manual handling techniques
4.	Materials on site	General	Cutting	3	3	9	Use appropriate PPE equipment / trained operatives
5.	Power tools / Electrical	General	Electrocution	2	5	10	Use 110v on site only / Check equipment before use
6.	Removal of existing doors	General	Lifting (muscular)	2	3	6	Use good manual handling techniques
7.	Window works	Removal of existing windows	Working at heights, Falls falling materials , lifting, maintenance, hot works	4	2	8	Provision and maintain scaffold / edge protection. Provide fall arrest harness. Wear PPE. Provide hoists Safe high level working practices, undertaken by specialist contractors
8.	Fire access and evacuation	Include item within H and S file	Escape and fire engine access	3	4	12	Safety design and procedures. Assembly point
9.	Asbestos Removal	First Operation	Working at height and asbestos exposure	5	5	25	Safe access capability by Design and correct removal and disposal of asbestos contained material

DESIGN RISK ASSESSMENT SUMMARY

Additional Comments:
NA

Distribution List:
Client, tendering contractors.

Further Reading / Useful Guidance Resources:
See below.

Additional Information:
The information contained within the document is based on the premise that any and all works detailed, will be undertaken by competent persons with an appropriate level of relevant training and skills.

Signed:	*L Gisborne*	Name:	Luke Gisborne	Position:	Building Surveyor	Date:	23.07.21

Appendix 1: **HSE GUIDANCE: Designers Red, Amber and Green Lists**

Red Lists: Hazardous procedures, products and processes that have been eliminated from the project where possible

- Lack of adequate pre-construction information, e.g. asbestos surveys, geological/ground surveys, obstructions, services, ground contamination etc.
- Hand scabbling of concrete ('stop ends', etc);
- Demolition by hand-held breakers of the top sections of concrete piles (pile cropping techniques are available);
- The specification of fragile roof lights and roofing assemblies;
- Processes giving rise to large quantities of dust (dry cutting, blasting etc.);
- On-site spraying of harmful substances;
- The specification of structural steelwork which is not purposely designed to accommodate safety nets;
- Designing roof mounted services requiring access (for maintenance, etc), without provision for safe access (e.g. barriers).
- Glazing that cannot be accessed Safely, All glazing should be anticipated as requiring cleaning and replacement, so a safe system of access is essential.
- Entrances, floors, ramps, stairs and escalators etc not specifically designed to avoid slips and trips during use and maintenance, including effect of rain water and spillages.
- Design of environments involving adverse lighting, noise, vibration, temperature, wetness, humidity and draughts or chemical and/or biological conditions during use and maintenance operations.
- Designs of structures that do not allow for fire containment during construction

Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.

- Internal manholes / inspection chambers in circulation areas;
- External manholes in heavy used vehicle access zones;
- The specification of "lip" details (i.e. trip hazards) at the tops of pre-cast concrete staircases;
- The specification of shallow steps (i.e. risers) in external paved areas;
- The specification of heavy building blocks i.e. those weighing > 20kgs;
- Large and heavy glass panels;
- The chasing out of concrete / brick / block work walls or floors for the installation of services;
- The specification of heavy lintels (the use of slim metal or hollow concrete lintels being alternatives);
- The specification of solvent-based paints and thinners, or isocyanates, particularly for use in confined areas;
- Specification of curtain wall or panel systems without provision for the tying (or raking) of scaffolds;
- Specification of block work walls >3.5 metres high using retarded mortar mixes.

Green Lists: Products, processes and procedures to be positively encouraged.

- Adequate access for construction vehicles to minimise reversing requirements (one-way systems and turning radii);
- Provision of adequate access and headroom for maintenance in plant rooms, and adequate provision for replacing heavy components;
- Thoughtful location of mechanical / electrical equipment, light fittings, security devices etc. to facilitate access and away from crowded areas;
- The specification of concrete products with pre-cast fixings to avoid drilling;
- Specify half board sizes for plasterboard sheets to make handling easier;
- Early installation of permanent means of access, and prefabricated staircases with hand rails;
- The provision of edge protection at permanent works where there is a foreseeable risk of falls after handover;
- Practical and safe methods of window cleaning (e.g. from the inside);
- Appointment of a Temporary Work Coordinator (BS 5975);
- Off-site timber treatment if PPA- and CCA-based preservatives are used (Boron or copper salts can be used for cut ends on site).
- Off site fabrication and prefabricated elements to minimize on site hazards.
- Encourage the use of engineering controls to minimize the use of Personal Protective Equipment

Appendix 2: **POSSIBLE DESIGN SOLUTIONS**

Hazard	Occurrence	Possible symptoms and/or consequences	Possible design solutions – requires assessment against other health hazards and control hierarchy (ERIC)
Physical			
Noise	Prolonged exposure to high noise levels. Pneumatic tools such as clay spades or rock drills. Machinery.	Long-term irreversible hearing loss.	E Specify low noise methods such as silent piling techniques. R Specify suitable job rotation, isolate equipment from employees. I Enclose noise source and provide adequate information of residual risks. C P.C. to identify additional control methods for any residual risk.
Manual Handling (lifting, carrying, pushing/pulling)	Hand excavation techniques. Erection of lining by hand. Use of heavy, awkward, slippery, sharp tools.	Pain including low back pain and restricted body movements that can lead to permanent disability. Prolapsed disc. Muscle/tendon damage.	E Specify materials which meet structural needs but are low in weight – e.g. concrete blocks which weigh less than 20kg. Adapt design so that mechanical assistance can be employed. R Consider site layout and ensure that suitable drop off points exist to minimise distances between this location and the work area. I Identify equipment that can be employed whereby personal intervention is removed. C P.C. to identify additional control methods for any residual risk.
	Repetitive, frequent or prolonged operations requiring force, gripping, squeezing of hands, rotation of wrists. Awkward posture	Work-related upper limb disorders. Pain numbness and restricted body movement which can lead to permanent disability.	E Adapt design so that mechanical assistance can be employed. R Consider site layout and ensure that suitable drop off points exist to minimise distances between this location and the work area. I Consider design to identify areas where work positioning may be difficult and identify in information provided. C P.C. to identify additional control methods for any residual risk.

Hazard	Occurrence	Possible symptoms and/or consequences	Possible design solutions – requires assessment against other health hazards and control hierarchy (ERIC)
Physical			
Vibration	Prolonged exposure to high vibration hand-held tools. Concrete/rock breakers. Clay spades. Percussive drills.	Hand-arm vibration syndrome. Tingling or pins and needles in the fingers and numbness. Whiteness at the fingertips when exposed to the cold. Finger paleness followed by rapid red hand flush, plus finger throbbing. More frequent attacks causing hand pain and reduced dexterity. Eventually blue-black appearance of fingers.	E Specify methods which will enable mechanical assistance to be employed R Consider opportunities to utilise low vibration solutions such as the Elliott Method. I Identify residual risks to assist P.C. in selecting suitable controls. C P.C. to identify additional control methods for any residual risk.
Heat	Hand excavation in conditions of high temperatures, high humidity, or low rate of air movement. Exacerbated by working in compressed air	Heat stress and strain. Exhaustion. Increased heart rate and body temperature and sweating, dehydration and salt imbalance. Fainting.	E Identify mechanical methods with in-built operator cooling / ventilation. R Incorporate cooling methods with specified plant designs. I Ensure suitable identification of potential is flagged-up to contractor for action C P.C. to identify additional control methods for any residual risk.
	Tunnelling / work in tunnels.	Heat stress and strain. Exhaustion. Increased heart rate and body temperature and sweating, dehydration and salt imbalance. Fainting.	See above
Hyperbaric atmosphere	Work in compressed air.	Decompression illness. Signs and symptoms can include: <u>Acute:</u> Limb joint pains, skin rashes, itching, mottling, numbness, tingling, weakness, paralysis, visual disturbance, unconsciousness and convulsions. <u>Chronic:</u> Bone necrosis.	E Specify non-pressurised methods where ground conditions / strata and project need allows. R Identify machinery where those exposed to pressurised environment is kept to a minimum. I Ensure suitable identification of potential is flagged-up to contractor for action C P.C. to identify additional control methods for any residual risk.

Hazard	Occurrence	Possible symptoms and/or consequences	Possible design solutions – requires assessment against other health hazards and control hierarchy (ERIC)
Chemical			
Cementitious materials, additives, epoxy resins.	Prolonged direct skin contamination of hands forearms, legs from converting, grouting, slurries, rock bolting. Application of sprayed concrete.	Redness, itching, scaling, blistering, cracking and bleeding of exposed skin causing irritant or allergic dermatitis.	E Specify non-hazardous materials. R Identify less hazardous product through assessment and selection of suitable alternative. I Identify type, location and quantities of hazardous product and ensure physical barriers are used such as containment. C P.C. to identify additional control methods for any residual risk.
Respirable crystalline silica	Machine cutting or rock. Application of sprayed concrete, drilling, breaking, crushing, conveying, cutting, loading of rock.	Increasing breathlessness, heart failure, acute silicosis, accelerated silicosis, lung fibrosis.	E Specify non-silica materials. R Utilise methods in design where dust generation is kept to a minimum and specify suitable mist suppression system and / or ventilation. I Identify where silica may exist throughout stages of the project and ensure physical barriers are used such as containment. C P.C. to identify additional control methods for any residual risk.
Other respirable dusts	Machine cutting of rock. Application of sprayed concrete, drilling and blasting.	Irritation of respiratory tract. Accumulation of dust in the lungs.	E Specify materials which are non-hazardous in nature. Design-out high dust methodologies. R Utilise methods in design where dust generation and those exposed is kept to a minimum (mechanical means and closed cab, etc). Specify suitable mist suppression system and / or ventilation. I Identify where silica may exist throughout stages of the project and ensure physical barriers are used such as containment. C P.C. to identify additional control methods for any residual risk.

Hazard	Occurrence	Possible symptoms and/or consequences	Possible design solutions – requires assessment against other health hazards and control hierarchy (ERIC)
Chemical			
Solvents	Skin contact, contamination of tunnel atmosphere. Contaminated land.	Principally skin irritation including dermatitis. Nausea and giddiness.	E Specify non-hazardous materials. R Identify less hazardous product through assessment and selection of suitable alternative. I Identify type, location and quantities of hazardous product and potential explosive / flammable atmospheres. Ensure physical barriers are used such as containment, utilise personal protective equipment, etc. C P.C. to identify additional control methods for any residual risk.
Hydrocarbons	Particulates from diesel engine exhaust emissions.	Irritation of eyes and respiratory tract. Might be a link with cancer (cause unclear).	E Eliminate substances which are hydrocarbon based. Consider R Sources and replace with less hazardous alternative. I Identify hydrocarbon based materials and ensure physical barriers are used such as containment, utilise personal protective equipment, etc. C P.C. to identify additional control methods for any residual risk.
Biological			
Contaminated water or soil	Infection through poor hygiene practices, skin cuts and abrasions or rubbing eyes when working in contaminated land or water sewage.	Weils Disease (Leptospirosis) – a bacterial infection carried in contaminated water and soil. Early symptoms include sudden high temperature, loss of kidney function, influenza like illness, joint and muscle pains. Conjunctivitis and jaundice can occur.	E Eliminate need for human interaction with contaminants. R Reduce activity which requires interactivity and specify cleaning / washing technology. I Clearly identify areas of contamination, cordon off and ensure the results of sampling show substances involved. C P.C. to identify additional control methods for any residual risk.