2.1 RESIDUAL HAZARDS & PROVISION FOR SAFE ACCESS

Introduction

All the residual hazards noted below are considered high risk. In all cases the End User is responsible for managing any health and safety risks associated with the hazards. People whose health and safety can be adversely affected by the hazards include members of the workforce and visitors to the facility.

The End User must ensure the following:

1. All members of the workforce must be fully trained, competent, and qualified for all cleaning and maintenance activities on the building. Appropriate reference must have been made to the Building Manuals and all personnel must have received an induction prior to commencing any works on site. The User of the building must ensure written method statements are prepared for specific activities and incorporated into the induction procedure.

2. Undertake risk assessments for activities, as noted above, in accordance with the Management at Work Regulations 1999 (the Management Regs).

    a. Every employer shall make a suitable and sufficient assessment of – the risks to the health and safety of his employees to which they are exposed whilst they are at work; and

    b. the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking,

3. Undertake COSHH assessments for activities, as noted above, in accordance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH). End Users should note:

    Using chemicals or other hazardous substances at work can put people's health at risk, so the law requires employers to control exposure to hazardous substances to prevent ill health. They have to protect both employees and others who may be exposed by complying with the Control of Substances Hazardous to Health Regulations 2002 (COSHH) (as amended).

Ensure that you are familiar with the whole of sections 1.3 of this manual prior to any maintenance work being carried out.

2.1.1 Structure and Fabric

Information provided by Hexa Consulting Ltd, the Civil and Structural Engineers

Potential Hazard	Design response	Residual Risk & Action
Overloading of upper floor slabs when the building is in service, for example due to the later addition of heavy mechanical plant.	The upper floor slabs are designed to support variable loads as defined in current design codes. These loads will be included within the building O&M manual.	The stated design loads for the slabs should not be exceeded.
Accidental or deliberate removal of load bearing member within the structural resulting in partial or complete collapse.	The building is designed to satisfy the requirements of Type 2B (Blocks B, C, D) and Type 3 (Block A) structures in accordance with Building Regulations Part A3, with reinforcement detailed to accommodate the appropriate tie forces in order to prevent disproportionate collapse.	The frame should not be altered without first consulting an appropriately qualified structural engineer.
Introduction of openings in the slab near to columns, resulting in punching shear failure	Slabs are designed to accommodate the drainage connections as shown on the architect's drawings.	No allowance is made for any future drainage therefore under no circumstances should cores be formed in the slab near to columns

2.1.2 Building Services

Information provided by WM Building Services, the Mechanical Services

Mechanical Services

All Apartments

1. Cleaning of air valves
2. Fall from height
3. All step ladders used to be in good condition and prolonged use to be avoided where possible

General

1. Domestic water services
2. Legionella exposure
3. Cleaning & maintenance regime & frequencies to be followed as detailed in operation & maintenance manual
4. Sterilisation of water services to be carried out annually

Basement Comms Room

1. Cleaning of wall mounted unit facia & cleaning / removal and replacement of filters
2. Fall from height
3. All step ladders used to be in good condition and prolonged use to be avoided where possible

Information provided by Skerritt Electrical Ltd, the Electrical Services

During the electrical design phase, consideration is given to any physical restrictions that might have an impact on the on the available footprint of switch rooms and plantrooms or any other areas identified for the installation of services.

To enable all equipment to fit into the designated space available, some items of equipment may have been installed at high level. If this is the case Skerrett's has identified any plant or equipment that requires limited maintenance or access.

Adopting this method reduces risks and delivers a safer working environment.

WORKING ON ELECTRICAL EQUIPMENT CAN BE DANGEROUS

All equipment that operates under automatic control can start at any time without warning.

A high proportion of the plant and equipment is of a specialist nature and will require the services of suitably qualified personnel.

It should always be remembered that no person should work or operate a piece of equipment unless they have been given specific training in doing so. Failure to respect this basic rule can result in serious accidents and injuries.

Before commencing maintenance work on any item of plant, it is imperative that all plant is mechanically isolated from the system and that electrical supply has been isolated and locked off. Where electrical isolation is remote or hidden view from the operative, warning notices should be

fixed to the isolators advising that they should not be switched on without checking that it is safe to do so. If possible, isolators should be locked off to prevent unauthorised operation.

Personnel should acquaint themselves with the safety requirements as stipulated under:

- Health & Safety at Work Act
- The Management of Health & Safety at Work Regulations
- The Electricity at Work Regulations
- Pressure Systems Safety Regulations 2000
- The Electrical Equipment [Safety] Regulations
- Provision & Use of Work Equipment Regulations

EXTRACTS FROM REGULATIONS & APPROVED CODE OF PRACTICE FOR GUIDANCE

The Electricity at Work Regulations 1989

The majority of the regulations are directed at hardware requirements. Installations are required to be of proper construction; conductors must be insulated, or other precautions take; there must be mean of cutting of the power and means for electrical isolation. The hardware requirements are complemented by a group of regulations stating principles of safe work practice. Regulation 14, which covers live working, is of particular importance.

Other important regulations along with regulation 14 are detailed on the following pages.

Adverse or Hazardous Environments [Regulation 6]

The construction and/or protection of the electrical equipment must prevent, so far as reasonably practicable, any danger arising from foreseeable adverse exposure[s]. Such exposures may include; mechanical damage; weather effects and other natural hazards, i.e. temperature or pressure; wet, dirty, dusty or corrosive conditions and flammable or explosive substances.

Means for cutting off the supply and for isolation [Regulation 12]

Suitable means for cutting off the electrical energy supply to equipment and for the isolation of any electrical equipment must be available. For clarity ‘cutting off’ the electrical energy supply is taken to mean ‘switching off’, while ‘isolation’ means switch off the equipment and the prevention of inadvertent reconnection.

In situations where equipment cannot be switched off or isolated all precautions must be taken, so far as reasonably practicable to prevent danger. They may apply to live working [see Regulation 14]. The defence provision applies to this requirement.

Precautions for Work on Equipment Made Dead [Regulation 14]

Adequate precautions must be taken to prevent ‘dead’ equipment from becoming ‘live’, if this gives rise to danger.

Note: Isolation from the normal electricity energy source may not be sufficient in all cases to prevent the equipment becoming live by accident, the isolators should be locked off using a personal lock system. All conductors should be proved ‘dead’ at the point of work before work commences.

Written procedures, such as permits may be used to formalise these types of work activities.

The defence provision applies to this regulation.

Work on or Near Live Conductors [Regulation 14]

No work activity may be carried out on or near any live conductor which gives rise to danger other than ones which are suitably insulated unless:

- It is unreasonable in all circumstances for the conductor to be dead
- It is reasonable in all circumstances for the work to be carried out on or near the conductor when it is live
- Suitable precautions are taken to prevent injury including protective equipment

The memorandum of guidance states that work on live conductors is only permitted where all three of the above conditions are satisfied and applies to situations where the danger is not prevented by the precautions specified in Regulation 7 [conductors to be suitably insulated]

Work on or near live conductors should be carried out by competent authorised personal and should be subject to permit-to-work systems within strictly defined limits.

This regulation will often apply to the testing of live conductors to determine whether they are dead or live. Conductors should always be assumed live until proven otherwise and the work carried out accordingly.

The defence provision applies to this regulation.

Working Space, Access and Lighting [Regulation 15]

Adequate working space means of access and lighting must be provided at all electrical equipment on or near which work is being carried out which may give rise to danger.

Work involving live conductors should provide adequate working space to allow the worker to stand back from the conductor without hazard, and where necessary allow persons to pass each other without risk.

Natural light is preferable to artificial light but in cases must be adequate to prevent injury.

This regulation is subject to the defence provision.

Persons to be Competent to Prevent Danger & Injury [Regulation 16]

No person may be engaged in any work activity where technical knowledge or experience is necessary to prevent danger or injury unless they possess such knowledge or experience or are under adequate supervision, as appropriate.

The memorandum of guidance states that technical knowledge or experience may include:

- Adequate knowledge of electricity
- Adequate experience of electrical work
- Adequate understand od the system and practical experience of the class of system
- Understanding the hazards and their precautions and the ability to recognise at all times whether it is safe to continue

This regulation is subject to the defence provision.

Electrical Equipment [Safety] Regulation 1994

The Electrical Equipment [Safety] Regulations 1994 revoke and replace, with minor amendments the Low Voltage Electrical Equipment [Safety] Regulations 1989. The 1994 regulations came into effect

on 9th January 1995, although they apply to electrical equipment put on the market prior to 1st January 1997 providing the equipment complies with the provisions of the 1989 regulations.

The 1989 regulations applied to electrical equipment operating in a voltage range of 50 to 1000 volts for alternating current and 75 to 1500 volts for direct current, which was 'safe' and constructed in accordance with good engineering practice. Electrical equipment which satisfied harmonised standards, or international safety provisions, or as a last resort, national safety provisions, was deemed to satisfy the safety and construction requirements above. The 1994 regulations add the proviso of 'unless there are reasonable grounds for suspecting that the equipment does not comply with harmonised standards and international safety provision, etc.'

The 1994 regulations re-enact all of the provisions mentioned above with minor amendments. The requirement for electrical equipment to be safe includes protection against riser of death or injury to humans or domestic animals, and damage to property. In addition, such equipment must meet certain general conditions and protect against hazards arising from the equipment itself and from external influences on the electrical equipment, as detailed in Schedule 3 of the 1994 regulations.

Electrical equipment that satisfies the requirement of the 1994 regulations must have the 'CE marking' affixed to it, or its packaging, information sheet etc. A written declaration of conformity containing specified information and certain technical documentation concerning the electrical equipment must be compiled and kept available for 10 years after manufacture after that particular equipment has ceased.

The regulations also require second hand electrical equipment, or electrical equipment hired out to be safe, although it does not have to comply with the requirements of the regulations relating to the 'CE Marking', EC conformity declarations and internal production controls.

Although the 1994 regulations were made under the Consumer Protection Act 1987, special provision is made where such electrical equipment is used in the workplace, for Health and Safety Executive to make arrangements for enforcing the regulations, as if the regulations were made under the Health and Safety at Work Act 1974.

General Electrical Safety Checklist

General rule whilst using electrical or mechanical equipment.

Electrical:

When using Portable Electrical Equipment check daily that:

- The equipment being used carried a current PAT test label
- There are no bare wires visible form any portable appliances being used and the socket they are plugged into is in good operational condition
- The insulation over the cables is not damaged and is free from cuts and abrasions
- The cable or flex is not trapped under other equipment
- The plug is in good condition
- If any residual current devices [RCD] are fitted, ensure that these are tested daily before use by pressing the test button and watching the marker change colours or light comes on
- That there are no cables obstructing doorways or access routes which may cause a trip hazard
- If an appliance is found to be faulty, notify the building manager and arrange for the equipment to be taken out of use and repaired or replaced. During the time that it is out of use, place a warning sign on it displaying:

WARNING!

EQUIPMENT FAULTY

DO NOT USE

Maintenance

Electrical faults can be rectified by competent, qualified, experience personnel.

If any faults re found, report them immediately to the building manager and take the appliance out of actions=.

Record of Maintenances activities must be kept.

Main Residual Risks

Lighting/Emergency Lighting/External Lighting Systems

- Falls from height
- Electrocution

Electrical Installation & Installed Equipment

- Falls from height
- Electrocution
- Auto start of equipment

Plant & Equipment Installed at High Level

- Significant risks if adequate controls are not implemented

Lamp/LED Replacement

- Falls from height
- Electrocution

Work on Live Equipment

- Electrocution
- DBs, emergency lighting, fire alarm panel [due to internal batteries]

General Electrical Hazards

- Electrocution
- Burns
- Cut and strains
- Eye injuries
- Back strain
- Minor physical injuries
- Tools
- Fire

Significant Risks

- Falls from height
- Back strain
- Burns and scalds
- Electrical hazards
- Eye injuries
- Minor physical injuries [Tools]

- Noise [Confined, reverberant spaces]
- Fire

Details of Control Measures

ONLY COMPETENT, TRAINED & QUALIFIED STAFF SHOULD CARRY OUT MAINTENANCE & REPAIR WORKS

Staff should be aware of their duties under the following regulations;

- Health & Safety at Work Act
- The 18th Edition of IEE Regulations
- Health & Safety [First Aid] Regulations
- Working at Height Regulations
- PPE Regulations
- COSHH Regulations
- Manual Handling Regulations
- LOLER & PUWER Regulations

Staff carrying our work on the building services and equipment must be aware of the risks of injury from;

- Electrical hazards
- Falls from height
- Trips and slips
- Handling heavy equipment & spares

Access

Access may be awkward in places and will require some pre-planning to ensure that the appropriate access equipment is available. This will be essential for the maintenance and replacement of the lighting systems.

Whoever is employed by the building occupier to carry out this task must be a competent trained tradesperson experienced in this type of work.

Use of mobile towers and podium steps are preferable and safer than working from steps or ladder. Mobile towers should only be constructed by trained qualified staff.

Mechanical aids must be used for the movement of heavy equipment or spares. If it is impossible to use the aids, suitable labour shall be made available to ensure the equipment is moved safely.

Other Procedures

Ensure the correct isolation of services is carried out before commencing repairs or maintenance. An electrical lock-off system and permit to work should be adopted to prevent any equipment being accidently energised.

Visually inspect the condition of the installation whilst carrying out the work.

General Information

On arrival to carry out repair or maintenance task, contract staff should make contact with client's nominate representative.

At this point, a site induction should take place and all the required permits to work filled out. The site should be prepared and any protective work on the building fabric or furnishings should be carried out. On completion of the works the site will be cleared and left in a clean safe state.

Electrical and mechanical maintenance should be integrated into a managed PPM [Planned Preventative Maintenance] scheme.

Records of maintenance activities must be kept.

2.1.3 Site Works and Infrastructure

Information provided by Glenn Howells Architects, the Architects

Reinforced concrete frame (slabs, columns, core, etc). SFS infill to perimeter with Stofix brick slip cladding the facade. Metal stud internal partitions

Information provided by Hexa Consulting Ltd, the Civil and Structural Engineers.

Storm water is collected above ground and discharged into the below ground drainage system. Storm water is disposed into public drains on Goodge Street North and Kent Street (refer to Hexa drawings 600326-HEX-00-00-DR-C-9200 and 9201). The flow rate is attenuated by flow control devices, with below ground storage provided below the car park and between Blocks A and B. Foul water is discharged into the public foul drain on Kent Street.

Information provided by WM Building Services, the Mechanical Services

Water Utilities

A new 32mm protectaline MDPE cold water main enters the boundary on Henstead Street and runs below ground where it enters the building within the Basement Plant Room, adapts to 35mm copper with stopcock, double check valve & draincock

Firefighting

To facilitate a reliable and immediately available distribution of water for Fire Brigade firefighting purposes, a dry riser system has been supplied and installed serving Block D

The dry riser system ensures water is available at each level of the stair core D1 to satisfy the local Fire Authority's requirements. Dry riser landing valves are fitted on each level from basement to Level 6.

The inlet breach valves serving the dry riser is located on the ground floor lobby front façade of Block D on the courtyard side (red steel inlet box 'Dry Riser Inlet').

2.1.4 Demolition

Information provided by Hexa Consulting Ltd, the Civil and Structural Engineers

Regulation 20 Demolition or dismantling

“The demolition or dismantling of a structure must be planned and carried out in such a manner as to prevent danger or, where it is not practicable to prevent it to reduce danger to as a low a level as is reasonably practicable”

Information provided by WM Building Services, the Mechanical Services

Prior to any demolition works be undertaken, please familiarise yourself with the mechanical installation. Items to take into consideration:-

Water – Ensure the main cold water is isolated to the building. External Incoming mcws is located from Henstead Street to the basement plantroom. Additional incoming isolation is located in within Block D plantroom. Ensure the systems is drained down across the apartments

Gas – there is no gas on this project

Refrigerants – there is a refrigerant ac system within the basement comms room & outdoor condenser in the carpark which will need the gas recovering prior to removal of the systems. Seek a specialist contractor for these works

2.1.5 Access Statement

Information provided by WM Building Services, the Mechanical

Services

Please see attached Scheduled Residual Maintenance Risks

Procedures

2.1.6 Any Hazards Associated with Materials Used

Information provided by Hexa Consulting Ltd, the Civil and Structural Engineers

Please see Deleterious Materials Letter 2.8

2.1.7 Removal or Dismantling of Installed Plant and Equipment

Information provided by Skerritt Electrical Ltd, the Electrical Services

N/A

Information provided by WM Building Services, the Mechanical Services

N/A

2.1.8 Residual Risk Assessments

Information provided by WM Building Services, the Mechanical Services

Information provided by Hexa Consulting Ltd, the Civil and Structural Engineers

Schedule of Residual Maintenance Risks Procedures

Project: M2167 - Kent Street Baths Birmingham

Ref:	Location	Description	Risks	Mitigation of Risk	Notes
1	Basment Refuse Store	Servicing of high level mounted fan	Fall from height	All step ladders used to be in good condition and prolonged use to be avoided where possible.	
2	Basement Comms Room	Removal of DX air conditioning indoor wall mount unit	Fall from height Back injury Refrigerant leaks Electrocution	All step ladders used to be in good condition and prolonged use to be avoided where possible. Two people at a minimum to be used to remove fan coils to ground level. Specialist contractors only to be used to pump down refrigeration system & confirm safe to work on. Registered electrician to ensure items to be removed are isolated and locked off & marked accordingly	
3	All Apartments	Removal of wall mounted ventilation units	Back injury Electrocution	Two people at a minimum to be used to remove fan coils to ground level. Registered electrician to ensure items to be removed are isolated and locked off & marked accordingly	
4	All Apartments	Cleaning of air valves	Fall from height	All step ladders used to be in good condition and prolonged use to be avoided where possible.	
5	General	Domestic water services	Legionella exposure	Cleaning & maintenance regime & frequencies to be followed as detailed in operation & maintenance manual Regular checks to be carried out on water temperatures throughout system to ensure a minimum circulation of 55 degree Celsius Ensure hot water secondary pump is properly maintained & out of operation	

				for a minimum period of time only Sterilisation of water services to be carried out annually to move and lift equipment	

DESIGNER'S HAZARD REGISTER

Project title	**Kent Street, Birmingham**	Project Stage	**In Service**	Completed by	**MTC**
Hexa Project Ref	**600326-HEX-XX-XX-RA-S-0001**	Date	**Sept 2024**		
Client	**Winvic**	Revision	**C01**	Discipline	**Civil & Structural**

Ref	Project Stage	Potential Hazard	Design response	Owner	Residual Risk & Action
1	In Service	Elevated levels of PAH, Lead, Mercury, Cyanide and asbestos were identified during the Geo-Environmental Site Investigation.	The risk to human health related to this contamination is assessed within the Geo-Environmental Site Investigation. Since the site is to be capped with hard paving the linkage to these pollutants is removed and hence the level of risk to the end user is considered to be acceptable.	End User	The capping layer is to be maintained throughout the lifetime of the development. Should areas of soft landscaping be introduced a minimum 600mm clean topsoil must be imported in accordance with the remediation strategy.
2	In Service	Overloading of upper floor slabs when the building is in service, for example due to the later addition of heavy mechanical plant.	The upper floor slabs are designed to support variable loads as defined in current design codes. These loads will be included within the building O&M manual.	End User	The stated design loads for the slabs should not be exceeded.
3	In Service	Accidental or deliberate removal of load bearing member within the structural resulting in partial or complete collapse.	The building is designed to satisfy the requirements of Type 2B (Blocks B, C, D) and Type 3 (Block A) structures in accordance with Building Regulations Part A3, with reinforcement detailed to accommodate the appropriate tie forces in order to prevent disproportionate collapse.	End User	The frame should not be altered without first consulting an appropriately qualified structural engineer.

DESIGNER'S HAZARD REGISTER

Project title	**Kent Street, Birmingham**	Project Stage	**In Service**	Completed by	**MTC**
Hexa Project Ref	**600326-HEX-XX-XX-RA-S-0001**	Date	**Sept 2024**		
Client	**Winvic**	Revision	**C01**	Discipline	**Civil & Structural**

Ref	Project Stage	Potential Hazard	Design response	Owner	Residual Risk & Action
4	In Service	Introduction of openings in the slab near to columns, resulting in punching shear failure	Slabs are designed to accommodate the drainage connections as shown on the architects drawings.	End User	No allowance is made for any future drainage therefore under no circumstances should cores be formed in the slab near to columns

This Designer's Hazard Register has been prepared in accordance with the Construction (Design and Management) Regulations 2015, and using the principles of Eliminate Reduce Inform Control (ERIC) and As Low As Reasonably Possible (ALARP).

RESIDUAL RISK REGISTER

This Design Risk Register unless otherwise stated relates to Building Construction Elements only, and will be updated periodically during the project and at the following review stages:

Project Review PR1 - Feasibility Stage
Project Review PR2 - Detailed Design Stage
Project Review PR3 - Tender/Construction Stage
Project Review PR4 - Handover Stage

Job Title: Kent Street Baths - Plot 1 - Block B

Client: EdR

Revision Ref: PR4

Revision Date: 26 September 2024

Principal Designer/ Risk Register Co-ordinator: Ben Mabbett

THIS DESIGN RISK REGISTER IS A CO-ORDINATED DOCUMENT INCORPORATING DESIGN TEAM MEMBERS INDIVIDUAL RISK REVIEWS COLLATED AT CDM WORKSHOPS HELD TO DATE

	Activity/ Significant Hazard	Project Lifecycle Stage	H&S Risk	Env Risk	Prog	Other	Persons at Risk	S (1-10)	L (1-10)	R1 (SxL)	Action taken to eliminate or control/ mitigate risk by design or procedure	S (1-10)	L (1-10)	R2 (1-10)	Reference Documents	Suggested guidance provided to Contractor for controlling significant residual risks	Residual hazards or maintenance risks remaining for the Client
	GENERAL SITE WIDE																
G9	Ground Works - Asbestos contamination:- Ground investigation indicates risk of asbestos contaminated land, creating risks to operatives, public and future occupants. Risk of identifying unforeseen contamination during ground works.	C	H	E			A	6	5	30	Minimum 600mm clean cover & hi-visibility geotextile marker layer to soft landscaped areas. 14/06/2022: The capping layer is to be maintained throughout the lifetime of the development. Should areas of soft landscaping be introduced a minimum 600mm clean topsoil must be imported in accordance with the remediation strategy. All construction workers are to wear PPE. The risk of encountering further contamination remains. Appropriate diligence and PPE to be adopted during ground works.	3	2	6	H&S File & Building Manual	Contractor to manage with procedures, PPE and sanitary facilities. If specific suspected materials are identified, the works shall be suspended immediately within the locality and the CA and PD shall be informed. Asbestos awareness training required for all operatives. Works shall only recommence on instruction and proof of safe entry. 14/06/2022: The capping layer is to be maintained throughout the lifetime of the development. Should areas of soft landscaping be introduced a minimum 600mm clean topsoil must be imported in accordance with the remediation strategy. All construction workers are to wear PPE. The risk of encountering further contamination remains. Appropriate diligence and PPE to be adopted during ground works.	Reference to significance of hi-visibility geotextile marker layer included in Building Manual & H&S File. All hazardous waste tickets to be added into H&S File for records. Any future ground works to be cogniscent of contamination risk beneath hi-visibility geotextile marker layer.

G10	Ground Works - Contaminated Land:- Ground investigation indicates risk of contaminated land, inc. elevated levels of PAH, Lead, Mercury, Cyanide, creating risks to operatives, public and future occupants. Risk of identifying unforeseen contamination during ground works.	C	H	E			A	6	5	30	Minimum 600mm clean cover & hi-visibility geotextile marker layer to soft landscaped areas. 22/09/2021: Buried fuel tank discovered on site and removed. 14/06/2022: The capping layer is to be maintained throughout the lifetime of the development. Should areas of soft landscaping be introduced a minimum 600mm clean topsoil must be imported in accordance with the remediation strategy. All construction workers are to wear PPE.	3	2	6	H&S File & Building Manual	Contractor to manage with procedures, PPE and sanitary facilities. 22/09/2021: Buried fuel tank discovered on site and removed. 14/06/2022: The capping layer is to be maintained throughout the lifetime of the development. Should areas of soft landscaping be introduced a minimum 600mm clean topsoil must be imported in accordance with the remediation strategy. All construction workers are to wear PPE.	Reference to significance of hi-visibility geotextile marker layer included in Building Manual & H&S File. All hazardous waste tickets to be added into H&S File for records. 22/09/2021: Include fuel tank removal. Any future ground works to be cogniscent of contamination risk beneath hi-visibility geotextile marker layer.
G11	Ground Works - Ground Gas:- Ground investigation indicates risk of ground gases, creating risks to future occupants.	O	H				R	5	5	25	Incorporation of CS2 level gas protection measures.	2	1	2	H&S File & Building Manual		Reference to inclusion of CS2 level gas protection in Building Manual & H&S File.
G14	Ground Works - UXO:- UXO study & ground investigation classifies site as high risk for presence of UXOs, creating risks to operatives, public and property.	C	H		P	O	A	6	4	24	Operational UXO Risk Management Plan; EOD Engineer Support & non-intrusive geophysical UXO survey; UXO Safety & Awareness Briefings to site operatives; Intrusive Magnetometer Survey across site and/or full supervision by EOD Engineer of excavations.	6	1	6	H&S File & Building Manual	Operational UXO Risk Management Plan; EOD Engineer Support & non-intrusive geophysical UXO survey; UXO Safety & Awareness Briefings to site operatives; Intrusive Magnetometer Survey across site and/or full supervision by EOD Engineer of excavations. Unsupervised dig limited to depth of existing basements where present, or 1m on virgin ground.	All UXO works records to be added into H&S File.
G17	Affects on wind due to large and tall blocks: Risks to users and passers by during operation, and to contractors from excessive wind gusts. Risks to materials/partially complete construction being lifted or moved by excessive wind gusts.	O	H			O	A	5	5	25	Desktop wind assessment completed at planning stage. Indicates no significant issues. Further computer modelling and wind tunnel testing being considered. Further investigations to be carried out to inform construction phase. 14/06/2022: Wind study completed and deems all safe. 17/08/2023: Gates to fire access route behind Block A adjusted to have correct amount of solid to void ratio as requireding wind report. 17/11/2023: 50% solid to void gates and railings between blocks to reduce wind risk issues.	2	3	6	H&S File & Building Manual	Desktop wind assessment completed at planning stage. Indicates no significant issues. Further investigations to be carried out to inform construction phase. 14/06/2022: Wind study completed and deems all safe.	14/06/2022: Wind studies to be included in O&M Manual. 08/04/2024: Any later alterations to buildings may require updated wind studies to ensure no elevated risk.
	MECHANICAL, ELECTRICAL & PUBLIC HEALTH																
MEP4	Fire Alarm: Alarm inaudible to those with hearing impairments - Risk to resident escape.	O	H				R	7	3	21	Fire alarm to include visual alerts in addition to audio alerts. 06/12/2022: Visual alerts only included in amenity areas. Not required elsewhere under regulations. Apartment alarms have ability to attach an optional module which turns the alarm into a wireless capable alarm, which in turn can be connected to personal devices providing visual or vibrating alerts.	3	1	3	H&S File & Building Manual	CLOSED	06/12/2022: Building manager to consider fitting of wireless module to fire alarms and issue of compatible visual and/or vibrating alert devices to apartments of any deaf residents.
MEP5	Fire Evacuation: Unfamiliarity of residents with fire alarm and escape procedures.	O	H				R	7	3	21	Inclusion of fire alarm and escape procedures within residents' handbook. Consider training sessions for residents to inform about fire alarm and escape procedures.	4	2	8	H&S File & Building Manual	Inclusion of fire alarm and escape procedures within residents' handbook. Consider training sessions for residents to inform about fire alarm and escape procedures. CLOSED	14/06/2022: Inclusion of fire alarm and escape procedures within residents' handbook. Consider training sessions for residents to inform about fire alarm and escape procedures.

MEP8	Potential increase in required electrical supply requirements for commercial units given decarbonisation agenda and switching from gas to electrical heating and cooking - Risks with later installation of new/larger power supplies.	C	H		P	O	C	6	4	24	03/11/2021: Client to consider increasing electrical supplies to commercial units. 03/11/2021: Consider installation of additional ducts to facilitate later installation of additional electricity supplies in lieu of increased supplies. 17/11/2023: Additional ducts added.	6	4	24	H&S File & Building Manual	CLOSED	14/03/2023: Tenant packs to make clear current utility provision, restrictions, and options for upgrades including additional ducts provided. 17/08/2023: Any additional ducts to be marked on as built drawings.
MEP10	Installation and maintenance of services at high levels i.e. requiring access equipment above floor level.	C	H				A	5	5	25	14/06/2022: Where possible, avoid design of services at high levels. Where services are required at high levels, safe access to be considered i.e. avoid stacking of services, provide adequate space for safe access around installed services and equipment for construction phase and future maintenance. Position services near easy fixing positions i.e. steels/purlins etc.	3	3	9	H&S File & Building Manual	14/06/2022: Safe Access equipment needed for installation. Construction Method Statement and Risk Assessments needed accordingly. Suitable access training needed for operatives etc. CLOSED	14/06/2022: Safe Access equipment needed for future maintenance. Suitable access training needed for operatives etc.
MEP11	Safe access for future maintenance and removal.	M	H				R	5	3	15	14/06/2022: Position equipment that requires access/accessible points for services i.e. access doors/valves in easily accessible positions/oversized doors, preferably without need for access equipment and with no need for enabling work e.g. not behind solid ceilings. Provide suitable access spacings for equipment to manufacturer's guidelines and avoid use of sharp edged services, equipment and fixings. Architect to provide suitably accessible ceilings/boxings/IPS where equipment is concealed/ Architect to design suitable access method for removal of plant both by manual handling and mechanical means. 02/08/2022: Head of door openings to be left out to ease installation of equipment. Specification of equipment which can be broken down into more managable parts.	3	2	6	H&S File & Building Manual	14/06/2022: Safe Access equipment needed for future maintenance. Client Maintenance Method Statement & Risk Assessments needed accordingly. Suitable access training needed for operatives etc. Construction Phase to follow drawings & manufacturer's guidelines. Where protection can't be provided to sharp edges, warning notices/tape to be applied. CLOSED	14/06/2022: Safe Access equipment needed for future maintenance. Client Maintenance Method Statement & Risk Assessments needed accordingly. Suitable access training needed for operatives etc. Construction Phase to follow drawings & manufacturer's guidelines. Where protection can't be provided to sharp edges, warning notices/tape to be applied.
MEP12	Contact with live services.	C	H				A	10	5	50	14/06/2022: Access to live services to be minimised by ensuring all live installations are concealed where possible and where exposed, labelled in accordance with regulations. Accurate drawings (construction and as fitted) to be provided so isolation points are easily identified. 02/08/2022: Adequate investigation of existing systems and their means of isolation. Design in adequate means of isolation and zoning of all new plant, equipment and systems. Specify no live working where practicable.	8	2	16	H&S File & Building Manual	14/06/2022: Live services always have some residual risk, training for use of services to be given. All equipment should be isolated prior to being serviced. Only qualified electrical engineers to carry out live testing/inspection of systems. Construction Method Statement and Risk Assessments needed accordingly. CLOSED	14/06/2022: Live services always have some residual risk, training for use of services to be given. All equipment should be isolated prior to being serviced. Only qualified electrical engineers to carry out live testing/inspection of systems. RAMS needed accordingly. 26/09/2024: Substations to be accessed by authorised power company operatives only.
	MAINTENANCE																

M1	Maintenance - Falls from Height & Slips, Trips & Falls: Flat roof access to maintain green roof, blue roof, rainwater outlets, and PV panels.	M	H			O	M	9	4	36	Access hatches to main roof together with minimum 1.1m high parapet to roof provided. Consideration being given to removing permanent edge protection, but would require replacement with mansafe and temporary edge protection during construction. 15/02/2015: Maximum parapet heights to be reviewed to take account of tapered insulation maximum depths (may result in higher than 1100mm parapet in places). Access requirements for replacement equipment to be considered. (PVs, etc.). 22/09/2021: Floor to ceiling balustrade provided at uppermost landing to provide fall protection to roof access hatch ladder. Ladder cage not provided as a result and due to limited amount cage required. Access hatch doubles as vent for staircase smoke ventilation. 02/08/2022: Walkways provided around roof perimeters and between PV sections to allow access. To be non slip paving slabs. Steps to be provided where access hatch is elevated to maintain compliance with 'utility stair' under AD K. 17/11/2023: Barrier protection installed around access hatches to prevent falls. 18/01/2024: Ladder been upgraded to include hoop and rising grab pole.	4	2	8	H&S File & Building Manual	Early installation of 1100mm high parapet to aid with construction stage safety. CLOSED	All access hatches to be unlocked prior to accessing roof to ensure alternative escape. Maintenance strategy and RAMS to be included within Building Manual and H&S File. 02/08/2022: FM team to ensure servicing personnel are properly briefed in the use of any access and cleaning equipment in accordance with manufacturers guidelines. FM team to ensure building occupiers are notified prior to any cleaning/maintenance activities being carried out. Roof drainage to be inspected and maintained. Access to be from roofs and at each floor within riser distribution zones. Maintenance to be carried out in accordance with building facilities management H&S policy and by trained personnel only. 02/08/2022: Roof access restricted to maintenance personnel only. 1100mm permanent parapet/guarding provided. Ladder from landing to roof access hatch to be protected with removable cover to prevent unauthorised climbing.
M2	Maintenance - Falls from Height & Items dropped from height: Window cleaning.	M	H			O	M	7	5	35	Windows to lower blocks to be cleaned from MEWP, with level hard surfaced paving to all facades of the building. 06/12/2022: MEWP access location points and tracking being carried out by GHA/WCL. 14/03/2023: All surfacing within courtyard to be hard surfaced or 'Grasscrete' type material to support MEWP. To be coordinated with landscape design.	3	2	6	H&S File & Building Manual	CLOSED	Maintenance strategy and drawings to be included within Building Manual and H&S File. 02/08/2022: FM team to ensure appropriate method is used. Façade to be cleaned externally by specialist, using a high reach pole cleaning system where applicable or MEWP where required. FM team to ensure cleaning personnel are properly briefed in the use of any equipment in accordance with manufacturer's guidelines. FM team to ensure building occupiers are notified prior to any cleaning/maintenance activities being carried out. Refer to cleaning and maintenance strategy for more information.
M3	Maintenance - Falls From Height: Courtyard maintenance and cleaning.	M	H			O	M	6	5	30	MEWP to be utilised for maintenance and cleaning. Adequately sized hard paved MEWP transit route through from courtyard entrances around courtyard to gain access to building frontages. Route to be shown on drawings. 03/11/2021: Loading capacity of courtyard deck upgraded to 31 tonnes to suit use of 36m boom MEWPs for construction & maintenance. Consider point loads for MEWP wheels. 06/12/2022: MEWP access location points and tracking being carried out by GHA. 26/03/2024: MEWP access location points and tracking included on Layer landscape drawing.	3	2	6	H&S File & Building Manual	CLOSED	Maintenance strategy and drawings, inc. loadings, to be included within Building Manual and H&S File. 02/08/2022: FM team to ensure appropriate method is used. Façade to be cleaned externally by specialist, using a high reach pole cleaning system where applicable or MEWP where required. FM team to ensure cleaning personnel are properly briefed in the use of any equipment in accordance with manufacturer's guidelines. FM team to ensure building occupiers are notified prior to any cleaning/maintenance activities being carried out. Refer to cleaning and maintenance strategy for more information.

M8	Maintenance - Falls from Height: - Risks of access to cooling plant on roof of Block E. - Risks accessing green roof of Block E. - Risks of accessing,, installing and replacing glazed roof light.	M	H				M	9	4	36	Consider location of plant in basement area rather than roof. If on roof, consider access hatches to roof together with mansafe system or 1100mm high parapet. 17/11/2023: Block E now an unheated pavillion type structure so no rooftop plant required. Does have green roof and glazed rooflight. Rooflight reduced in size to 2m diameter to ease installation and replacement, which will need to be via MEWP and davit. Roof to be accessed by MEWP so suitable 'landing area' to be identified, with mansafe latch system provided to access remainder of roof once out of MEWP.	4	2	8	H&S File & Building Manual		All access hatches to be unlocked prior to accessing roof to ensure alternative escape. Maintenance strategy and RAMS to be included within Building Manual and H&S File. 17/11/2023: Mansafe system details and certificates to be included in H&S File and Building Manual.
M9	Maintenance - Falls from Height & Items Dropped from Height: Replacement of glazed units to windows.	M	H				M	8	5	40	03/11/2021: Internal reglazing strategy confirmed. Route through building to be plotted to allow glazing units to be brought through building. 03/11/2021: Framing design changed to reduce glass size and allow internal reglazing. 17/01/2022: Glazing unit tracking drawing to be updated to suit larger lifts & small glazing unit size.	5	3	15	H&S File & Building Manual	CLOSED	Maintenance strategy and drawings to be included within Building Manual and H&S File. 02/08/2022: FM team to ensure appropriate method is used. Glazing to be replaced internally with manipulation externally via MEWP from ground level dependent on height. FM team to ensure maintenance personnel are properly briefed in the use of any equipment in accordance with manufacturer's guidelines, and PtW system in place. FM team to ensure building occupiers are notified prior to any cleaning/maintenance activities being carried out. Refer to cleaning and maintenance strategy for more information.
M11	Maintenance of public and private garden areas	M	H			O	R	5	3	15	02/08/2022: Maintenance strategy required for ongoing maintenance during occupancy to be agreed with LA. Consider specification of planting to prevent overgrowing beyond space available and take into account required maintenance regime. 17/11/2023: Bib taps added to courtyard for watering soft landscaping.	5	3	15	H&S File & Building Manual	CLOSED	02/08/2022: Maintenance strategy required for ongoing maintenance during occupancy to be agreed with LA. FM team to ensure maintenance personnel are properly briefed in the use of any access and equipment in accordance with manufacturers guidelines. FM team to ensure building occupiers are notified prior to any major landscaping alterations (for example tree felling). Safe access required for working at height on roof and podium gardens.
M13	Refuse Collection: Risks to operatives in moving bins to street collection point, including collisions with vehicles.	M	H				M	5	5	25	02/08/2022: Bins are required to be brought out from basement bin stores on collection day as dragging distance for collection teams is too long. Appropriate risk assessments to be carried out by FM team in order to avoid collisions between other vehicles cars service personnel, building users etc. Appropriate HV clothing to be worn at all times whilst servicing the site. Collection times to be pre-agreed through CC with FM in advance.	3	5	15	H&S File & Building Manual	CLOSED	02/08/2022: Appropriate risk assessments to be carried out by FM team in order to avoid collisions between other vehicles cars service personnel, building users etc. Appropriate HV clothing to be worn at all times whilst servicing the site. Collection times to be pre-agreed through CC with FM in advance.
	ARCHITECTURE																	
A13	Basement car park access: - Access control system (potentially ANPR or fob access) to car park holding up vehicles entering, causing traffic to back up on public highway blocking road and cycle path. - Risks to personal safety of people hiding in or anti social behaviour in car park access recess.	O	H				O	5	5	25	14/03/2023: Consider moving shutter/gates further into vehicle entrance to allow space for vehicle to wait off public highway. May have management issues related to creating a covered recessed space for antisocial behaviour, so CCTV and on site management to be considered. 17/08/2023: Gates set back from public highway as required by BCC Highways to allow car to pull off road whilst car park gates open. 17/11/2023: CCTV cameras to be installed in car park recess to monitor area. Gaps between gate bars widened to allow greater visibility through gates.	5	5	25	H&S File & Building Manual	CLOSED	14/03/2023: On site management of area to be considered by client going forward.
	FIRE																	

F3	Fire service access to courtyard and required area of façade for firefighting.	O	H				R	10	2	20	Design for fire tender access to courtyard to be finalised and agreed. 02/08/2022: Route via rear of Block A. Width agreed. Is tracking required to access gates on public highway? Are double yellow lines being installed on public highway to ensure access to gates are kept free? 06/12/2022: New bellmouth and drop kerb being installed to ends of fire tender access lane to create dedicated access as part of S278 works. 22/12/2022: The access provisions specified in the fire strategy should be complied with. 14/03/2023: Fire tender tracking completed by Hexa to confirm route through courtyard at rear of Block A. 17/08/2023: Fire tender tracking via courtyard side of Block A complete and included on Hexa drawings.	4	2	8	H&S File & Building Manual	CLOSED	17/08/2023: Fire tender access route to be kept clear at all times by FM team.
F16	Unknown uses of commercial spaces. Class and extent of sprinklers and fire alarm to be determined: Risks that if increased sprinkler requirements needed, then tanks will not be large enough.	O	H				O	10	4	40	03/05/2022: Potential commercial uses to be ascertained from client, including limits on uses, to inform sprinkler and tank design. 02/08/2022: Block A to have full OH2 sprinklers to commercial areas. Block B to be capped and left as shell & core for later installation during fit out. 11/01/2023: BB7 consider it unlikely that the use of such a space would warrant an increase to OH3 system, however, we agree that the use of the space should be confirmed as early as possible. L2 fire alarm provided. Fire alarm and sprinkler system will require redesign and alteration to accommodate final uses and tenants at fit-out stage. Other ancillary areas provided with L3 fire alarm system. 14/03/2023: Tanks adequately sized to allow residential amenity areas to be converted to commercial space and have consequential upgrade of sprinkler category.	5	3	15	H&S File & Building Manual	CLOSED	02/08/2022: Information for later connection of sprinkler system in Block B commercial unit to be included in Building Manual. 11/01/2023: Fire alarm and sprinkler system will require redesign and alteration to accommodate final uses and tenants at fit-out stage. 14/03/2023: Additional sprinkler tank capacity to be detailed in H&S File and O&M Manual, including any individual unit information packs.
F28	Retail units and ancillary areas occupances affected due to number of escape doors and inward opening doors. Risks: - Risks to staff and customers due to limits on occupancy if numbers not managed.	O	H				V	10	4	40	11/01/2023: Occupances limited in some retail units and amenity areas, so will require management by end user/tenant to keep within these limitations.	5	1	5	H&S File & Building Manual	CLOSED	11/01/2023: Fire Strategy drawings to clearly indicate maximum occupancies in retail and ancillary units. 14/03/2023: Tenant packs to make clear maximum occupancies and other restrictions..
F29	Block E amenity hub building has single stair means of escape so is limited to 60 persons. Risks: - Risks of larger amount of people using Block E and compromising escape from building.	O	H				R	10	4	40	11/01/2023: Building management team to impliment process to manage numbers of people using Block E amenity hub. 18/01/2024: Block E design change to single storvey open pavillion structure.	5	1	5	H&S File & Building Manual	CLOSED	11/01/2023: Building management team to impliment process to manage numbers of people using Block E amenity hub. Fire Strategy drawings to clearly indicate maximum occupancies in retail and ancillary units.
F32	Requirements of The Fire Safety Order (England) 2022: - Requirement for floor & apartment number directional signage to be visible in dark & smoky conditions. - Requirement for emergency information box at Fire Service access points.	O	H		P	O	R	8	4	32	14/03/2023: Design to take into account new requirements as part of The Fire Safety Order (England) 2022, which are enforced regardless of the Building Regulations version being complied with. 17/08/2023: Location of fire service Property Information Boxes included on GHA drawings. Signage proposals provided and comment received from BB7. To be checked with WMFS and Building Control. 17/11/2023: Awaiting final check of wayfining signage. 18/01/2024: Acivico to review on site prior to competion.	8	4	32	H&S File & Building Manual	CLOSED	17/08/2023: FM team to provide Emergency Response Packs and to be placed in Property Information Boxes prior to occupation. 08/04/2024: Fire Strategy and associated documentation to be included in H&S File and Building Manual.
	LANDSCAPE ARCHITECT																

LA2	Soft landscape planting. Risks: - Allergic reactions to plants.	C	H				C	5	4	20	18/11/2022: Avoid known common plants which cause severe allergies. Staff training/awareness Well maintained tools & equipment Horticultural knowledge Work instruction/Safety Code of Practice GMWI07	2	2	4	H&S File & Building Manual	18/11/2022: Staff training/awareness Well maintained tools & equipment Horticultural knowledge Work instruction/Safety Code of Practice GMWI07	18/11/2022: Any risks remaining with potential allergies from plants to be recorded in H&S File and Building Manual, especially in relation to maintenance.
LA3	Use of maintenance machinary, such as strimmers, mowers, etc. Risks: - Moving machinary and entanglement - Carrying equipment for long periods of time	M	H				M	4	3	12	18/11/2022: No loose clothing to be worn Staff training/awareness Safety guards Deadman's handle operation Work instruction/Safety Code of Practice GMWI01 Safety Boots/Gloves Carry harness Trained staff Regular breaks	3	3	9	H&S File & Building Manual	18/11/2022: No loose clothing to be worn Staff training/awareness Safety guards Deadman's handle operation Work instruction/Safety Code of Practice GMWI01 Safety Boots/Gloves Carry harness Trained staff Regular breaks CLOSED	18/11/2022: No loose clothing to be worn Staff training/awareness Safety guards Deadman's handle operation Work instruction/Safety Code of Practice GMWI01 Safety Boots/Gloves Carry harness Trained staff Regular breaks
LA4	Pesticide Operations. Risks: - Chemical related illness - Environmental damage to surroundings	M	H				M	6	3	18	18/11/2022: Trained / Certificated staff in accordance with Pesticide Regulations Work Instruction / Safety Code of Practice GMWI03 COSHH Assessments Low toxicity MAFF approved chemicals Appropriate protective clothing & equipment Disposable coveralls Spraying log Use of “closed in” systems where possible (C.D.A)	4	4	16	H&S File & Building Manual	18/11/2022: Trained / Certificated staff in accordance with Pesticide Regulations Work Instruction / Safety Code of Practice GMWI03 COSHH Assessments Low toxicity MAFF approved chemicals Appropriate protective clothing & equipment Disposable coveralls Spraying log Use of “closed in” systems where possible (C.D.A) CLOSED	18/11/2022: Trained / Certificated staff in accordance with Pesticide Regulations Work Instruction / Safety Code of Practice GMWI03 COSHH Assessments Low toxicity MAFF approved chemicals Appropriate protective clothing & equipment Disposable coveralls Spraying log Use of “closed in” systems where possible (C.D.A)

RISK REGISTER KEY

Project & Lifecycle Stage	C	Construction
	D	Demolition
	O	Operational
	M	Maintenance
Health & Safety Risk	H	Select 'H' if the hazard will impact on health and safety
Environmental Risk	E	Select 'E' if the hazard will impact on environmental aspects
Programme Risk	P	Select 'P' of the hazard will impact on project programme
Other Risk	O	Select 'O' if the hazard will impact on other aspects
Persons at Risk	A	All
	S	Staff
	C	Contractor
	M	Maintenance
	R	Resident
	V	Visitors
	O	Others

NOTE:- Standard construction hazards that a competent contractor would be aware of, have not been considered. Examples: Manual Handling, working on scaffolds, working at height, working in and around excavations, steel erection, roofing work, working with cement-based materials, COSHH and PPE etc. It is expected that a competent contractor will have in place safe systems of work and method statements for the tasks they perform.

The risks identified above are only those that may not be immediately apparent.

Risk Analysis Matrix (Red/Amber/Green)											
		Likelihood									
		Very Unlikely	Unlikely	May Happen			Likely		Very Likely	Certain	
Severity		**1**	**2**	**3**	**4**	***5***	**6**	**7**	**8**	**9**	**10**
Death - Multiple or Single	**10**	10	20	30	40	50	60	70	80	90	100
Major Injury/Disabling Illness/Major Damage	**9**	9	18	27	36	45	54	63	72	81	90
	8	8	16	24	32	40	48	56	64	72	80
	7	7	14	21	28	35	42	49	56	63	70
Injury/Lost Time Illness/Damage	**6**	6	12	18	24	30	36	42	48	54	60
	5	5	10	15	20	25	30	35	40	45	50
	4	4	8	12	16	20	24	28	32	36	40
	3	3	6	9	12	15	18	21	24	27	30
Minor Injury/Damage/Illness (not lost time)	**2**	2	4	6	8	10	12	14	16	18	20
Trivial Injury	**1**	1	2	3	4	5	6	7	8	9	10

Severity	
Death - Multiple or Single	10
Major Injury/Disabling Illness/Major Damage	7 - 9
Injury/Lost Time Illness/Damage	3 - 6
Minor Injury/Damage/Illness (not lost time)	2
Trivial Injury	1
Likelihood	
Certain	9 - 10
Very Likely	8
Likely	6 - 7
May Happen	3 - 5
Unlikely	2
Very Unlikely	1