

Completion of This Design Stage Fire Risk Assessment

This assessment is required in order to ensure that those with construction design responsibility are complying with their duties under the Construction Design Management (CDM) Regulations 2015. Particular attention is required to Regulation 11, including the identification of any temporary fire precautions that may need to be implemented during the construction phases. This will ensure that in the event of a fire incident occurring, any potential risks to the future occupiers of the building will have been identified and will be adequately controlled by the use of appropriate design guidance: it will also help to ensure the safety of all those involved in its construction.

Detailed information on how to appropriately manage fire risks during construction and building renovation works can be found in the Health and Safety Executive's (HSE) Guide HSG168: *Fire safety during construction*, and in the Fire Protection Association's (FPA) Joint Code of Practice (JCoP) on *The Protection from Fire of Construction Sites and Buildings Undergoing Renovation*. Additional specialist guidance notes are also available from other agencies including the Structural Timber Association (STA) and others, and these must be referred to where applicable when undertaking this assessment. Note that the use of specialist advisors may be necessary for this purpose.

The Design Manager must ensure that this assessment is completed and updated as required while design progresses. A completed and signed copy is to be passed to the construction team in advance of any works commencing on site, at which time the initial construction phase fire risk assessment and emergency plan will be completed by the Fire Safety Coordinator (usually the Senior Site Manager or equivalent). The information provided in this assessment is essential for the Fire Safety Coordinator to plan the required action to be taken in the event of a fire emergency, and to ensure that suitable means of escape are available in advance of each phase of the development.

1. Assessment Details:

Business Unit:	Kier Construction – Regional Building North & Scotland	Project:	Manchester Aquatics Centre	Construction Commencement Version Date:	06.12.2021
Design Manager:	Derek Rostron (Ass. Zara Edmondson)	Contract Manager:	Peter Gleave	Date of Assessment:	04.10.2021

2. Details of Structure:

Frame Type:	Height of Building:	Build Type:	Occupancy During Construction:
Concrete ☒	4 storeys or less ☒	Entirely new build ☐	No other occupants ☐
Steel ☒	More than 4 storeys ☐	Redevelopment of an existing building ☐	Occupied but fully segregated ☒
Timber ☐	High rise ☐	Mixed new build & redevelopment of existing ☒	Occupied and un-segregated ☐
Other ☐	More than 1 basement level ☐	Includes demolition phases ☒	Phased handover ☒

Enter a brief description of the construction below:

The project comprises of the refurbishment of Manchester Aquatics Centre, Manchester. The building comprises of a large pool hall with a full 50m competition pool, diving pool and a splash zone. In addition, the building also houses, a changing village, health suite, gym & fitness areas and a further 50m training pool within the basement.

It is critical to ensure at least 1 of the 50m pools is available throughout the works therefore we have proposed a 2 phased approach to the works.

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This phasing provides continuity by completing the main pool (and required Plant) in phase 1 together with the rest of the ground and first floor facilities and new environment entrance in preparation for the Para Games in July 2023, whilst the remainder of the facility is closed for refurbishment in phase 2 following completion of the Para Games.

The phasing was developed with Manchester Active, GLL and our design team and supply chain

Enter a description of any existing building occupancy and the plans to phase occupancy during construction (if applicable) below:

See Internal Logistics – Permit to work Systems to be implemented

3. Summary Risk Classification:

Construction Works: Does the method or type of construction define the project as high fire risk? Yes ☐ No ☒	Occupancy and Adjacencies: Does any shared occupancy or adjacency present a high fire risk? Yes ☐ N/A ☐ No ☒
Environmental Considerations: Are there any natural habitats or wildlife areas requiring fire protection? Yes ☐ No ☒	Water Courses and Protected Land: Is the site subject to an environmental permit? Yes ☐ No ☒
If you have answered yes to any of the above, enter a description of the risks identified and any required control measures below:	

4. Design Guidance:

What method has been adopted to ensure the requirements of Articles B1-B5 of the Building Regulations have been met with regard to fire safety?	
Approved Document B ☒	British Standard 9999 ☐
BS9991 ☐ e.g Scottish Non-Domestic Handbook Section 2 ☐ Other ☐	
Enter a brief description of the design fire strategy below, including the evacuation plan: Phase 1 consists of the closure and refurbishment of the ground and first floors (see SPL's report for enclosed in red below (figures 1 & 2)). The works includes the closure of the main swimming pool area on the ground floor and the first-floor accommodation. The work is anticipated to be completed within 76 weeks. Management of the ground and upper floor areas once operational is discussed in the fire alarm section.	



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Construction phase 2 consists of the closure and refurbishment of the basement pool area (figure 4), the ground floor west staircase (figure 1). Phase 2 areas are highlighted in blue on the figures 4 & 5.

Phase 2 works is estimated to take approximately 38 weeks; however, Phase 1 works will be running in conjunction with phase 2 in the basement area for 2 weeks of this phase. Phase 1 construction works in the plant room must be taken into consideration alongside Phase 2 from a construction site fire safety prospective and the management of escape routes.

The main entrance to the construction site will be through the doors highlighted with a green arrow in figure 2 overleaf. Means of escape from the basement area will be via the West or East staircases; in addition, there are 2 means of escape from the plant area which are shown in (figure 6). The means of escape from both the plant areas and the pool area must be maintained at all times whilst construction works are undertaken.

Does the building's fire strategy include the use of any significant fire engineered solutions (e.g. smoke control)?

Yes ☒

No ☐

If yes, enter a description of these design elements and how they may affect the construction stages:

The heat and smoke extraction system in the basement plant area will remain operational throughout the refurbishment. Therefore, consideration must be taken into account of how the extracts can be powered and also linked into the fire alarm system whilst work is being carried out in the basement area.

5. Means of Escape (the maximum recommended travel distances along means of escape during construction are detailed in Table 1 of HSG168):

Enter a description of the required means of escape from the building while it remains open or only semi-enclosed below:

See SPL's Construction Site Fire Strategy report for details.

Means of escape from the basement area will be via the West or East staircases; in addition, there are 2 means of escape from the plant area which are shown in (figure 6). The means of escape from both the plant areas and the pool area must be maintained at all times whilst construction works are undertaken.

Enter a description of the required means of escape from the building prior to it becoming enclosed below:

Staircases 1 & 4 will be kept open. 1 will be used for the contractors however in an emergency this will be available.

Will the means of escape require fire protection during construction phases in order to meet recommended travel distances?

Yes ☒

No ☐

If yes, enter a description of the extent of these fire protection requirements and at what stage they will be required below:

60-minute fire resistance.

Will the means of escape require temporary provision (e.g. haki stairs, scaffold egress) during the construction? Yes ☐ No ☒

If yes, enter a description of the extent of the fire protection requirements and at what stage they will be required below:

6. Fire Alarm and Detection:

What is the required provision for electronic fire alarm and automatic detection facilities during construction?

Retain existing fire alarm system ☐ or provide temporary fire alarm coverage: Manual alarm only ☐ Manual & automatic detection ☒

Enter a description of the existing and/or proposed fire alarm and detection system below:

At present, MAC have a BS 5839 part 1 L2 fire detection and alarm system installed throughout the premises, linked to the public address and voice alarm system (PAVA). As part of the refurbishments being carried out, this will be decommissioned and replaced with a new fire detection and alarm system conforming to BS 5839 part 1 2017. Management of the fire alarm in the temporary state – In phase 1, the fire alarm will be decommissioned on the ground and first floor construction site areas. The system will be replaced with a WES wireless fire alarm system on the construction site, the temporary alarm must be interfaced with the old fire alarm system. Should the fire alarm activate (basement area), MAC should operate as normal i.e., investigation, double knock and immediate evacuation. However, should the fire alarm operate on the construction site (phase 2) then the fire alarm should go into full evacuation with no investigation time.

7. Access and Facilities for The Fire and Rescue Service:

What are the required firefighting and access facilities for the completed building?

Building perimeter access ☒ Access from a fixed external point ☐ Dry rising mains ☐ Wet rising mains ☐

If dry or wet rising or falling mains are required, at what point must they be provided during construction?

Not Applicable

What perimeter access will be required during construction, including any access required prior to the provision of any mains as described above?

See external Logistics

What are the requirements for a firefighting water supply for the completed building?

Existing hydrants ☒ Provision of new hydrants ☐ Emergency water supplies ☐ Other ☐

Enter a description of the site's firefighting water supplies below, including any temporary provision required during construction:

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Fire points should be positioned throughout the construction site and each fire point should consist of the following firefighting equipment.

- 1 x 6L Foam extinguisher or 1 x 9L Water extinguisher,
- 1 x 2Kg CO2 fire extinguisher,
- 1 x stand for the extinguishers to be stored on,
- 1 x foam or water extinguisher sign
- 1 x CO2 fire extinguisher sign.
- Fire escape plan from the area the fire point is located

8. Limiting Fire Spread Across Surfaces:

Does the build present a risk of rapid fire spread or structural failure during construction? (If no, continue to the next section)	Yes ☐	No ☐
Can flame retardant or protective treatments be factory applied to materials before delivery to site?	N/A ☐	Yes ☐ No ☐
If no to above, will temporary surface protection or surface coverings be required during construction?	Yes ☐	No ☐
Enter a description of the surface protection requirements during construction below:		

9. Limiting Opportunities for Fire Spread Within the Building:



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Is compartmentation required as part of the fire strategy? (if no, continue on to next section)	Yes	☐	No	☐
If yes, is this required during construction stages?	Yes	☐	No	☐
Enter a description of the extent of the fire containment that will be required and the recommended time of its implementation below:				

10. Limiting Ignition Risks on Site:

Is the type or method of construction defined as being high risk?	Yes	☐	No	☐
If yes, have hot works including soldering been precluded by alternative types of mechanical specifications?	N/A	☐	Yes	☐
If no, enter a description of the extent of hot works that will be required and the methods of their control below:				
How does the design cater for live service provision before building completion? Consider live dates for water/gas/electric and controls				
Does the fire safety guidance applicable to the type of construction permit smoking on site?	Yes	☐	No	☐
If yes, describe the intended location of a suitable smoking point below:				

11. Further Comments

Enter any further relevant information below:

12. Site Mobilisation *(to be completed in conjunction with the Fire Safety Coordinator for the site)*

Have any risks and necessary control measures identified in sections 2-11 above been agreed with site management?	Yes ☐	No ☐
Does the Fire Safety Coordinator have all of the design information required to complete the fire emergency plan?	Yes ☐	No ☐
Is an initial construction phase fire risk assessment (SHEMS-FOR-GR-076) ready to be completed?	Yes ☐	No ☐
If you have answered "No" to any of the above, this assessment must be revised as necessary until works are able to safely commence on site.		

The information provided in the assessment above provides an accurate description of the potential fire safety risks that have been identified throughout the design phase, and the control measures that will be required to mitigate them during construction to a level that is as low as reasonably practicable.

Design Manager

Name:

Signature:

Version
Date:

Comments:

Contract Manager

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Name: Comments:	Signature:	Version Date:
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Site Fire Safety Coordinator		
Name: Comments:	Signature:	Version Date:

Definitions:

High Risk Construction Site: a high risk construction site is defined in the JCoP as a site that meets any of the following descriptions:

- a) A high-rise construction site (see below).
- b) A large project (i.e. £20million contract value or greater).
- c) A large timber frame structure (i.e. 4 or more storeys, or an aggregate floor area of greater than 2,500m²).
- d) Projects where a risk assessment indicates there may be a significant potential for loss of property, or risk to life.

Timber Frame Construction Site: timber framing includes the use of cross laminated timber panels, gluelam beams, and SIPS panel type construction methods. During construction and until such time as the timber elements are encapsulated in masonry/render/plasterboard etc, the timber may be exposed with an associated risk of flame travel across its surface, rapid fire development, fire spread between buildings, and the potential for early structural failure leading to collapse.

High-Rise Construction Site: is defined by the JCoP as a site where the workforce is at risk by being outside the distance by which the Fire and Rescue Service can affect a rescue by mechanical means (currently 30m reach from the position where a fire appliance may be parked). Consider also the benefits of early provision of rising mains for use by the Fire Service, most particularly in buildings over 4 storeys in height, and as required by the final firefighting strategy.

Hot Works: site operations including those that include the use of open flames; grinding; welding; the generation of sparks; or the local application of heat to materials.

Segregated sites: those separated from the remaining premises by an unbreached partition, such as a fire wall affording an appropriate period of fire resistance.

Un-segregated sites: those within, or that form part of, another premises that remain or become occupied by persons other than those working on construction.

Temporary buildings: includes prefabricated cabins, site huts, cargo containers, caravans, portable and sectional buildings brought onto site for use as offices, stores, workshops, welfare facilities etc, during the course of the works.

Temporary accommodation: a segregated part of the building under construction or undergoing refurbishment and occupied as offices, stores, workshops, welfare facilities etc, during the course of the works.

Environmental permits: these may be required for installations, waste or mining waste operations, water discharge or groundwater activities, or work on or near a main river or sea defence. Where applicable, conditions of a permit may include containment of firefighting water run-off or additional on-site fire precautions.

Recommended Travel Distances During Construction:**Table 1 of HSG168: Fire safety during construction, maximum travel distances in traditional, concrete or steel framed structures**

	Fire hazard		
	Lower	Normal	Higher
Enclosed structures			
Alternative	60 m	45 m	25 m
Dead-end	18 m	18 m	12 m
Semi-open structures			
Alternative	200 m	100 m	60 m
Dead-end	25 m	18 m	12 m

Risk Classifications and Definitions To Be Adopted When Referencing The Table Above:

Semi-open structures: are completed or partially constructed structures in which there are substantial openings in the roof/floors and the external walls which would allow the smoke and heat from a fire to readily disperse. This ensures any occupants are not at early risk of exposure to heat or smoke logging from a fire on the site.

Alternative escape routes: are those that can lead occupants in substantially opposite directions. The principle is that they are sufficiently apart such that a fire should not immediately affect both routes, and occupants can evacuate away from fire and smoke. In order to qualify as alternative escape routes, they must be not less than 45° apart.

Dead-end (or single direction) travel distances: are required to be significantly restricted. This is so people have time to evacuate past any fire between them and their exit before it threatens their safe escape by heat development or smoke logging.

Lower-hazard areas: are those within which there is very little combustible material present, and the likelihood of a fire occurring or developing rapidly is low. Examples could be steel or concrete clad framework, or structures in pre-fitting-out stages.

Normal-hazard areas: will cover the majority of situations. Some ignition risks and flammable or combustible materials are present, but they are of such a type and disposition that any fire will initially be localised.

Higher-hazard areas: are locations where significant ignition risks or quantities of flammable or higher combustibility materials are present, such that in the event of a fire its rapid spread may occur, possibly accompanied by evolution of copious amounts of smoke. Management precautions that minimise the fire load and risks of ignition should ensure that such areas are rare on construction sites. Examples of where they might occur are demolition or refurbishment works involving oil-contaminated wooden floors or linings; fixing floor and wall coverings using flammable adhesives; and hot works where there may be combustible frame elements (e.g. timber frame).

Travel distances: are measured as the actual distance a person must walk and not as the crow flies. Care should be taken to minimise obstructions so that maximum travel distances are not exceeded. It is a sensible precaution to arrange the work to keep travel distances as short as possible.

Travel distances in timber frames: note that the maximum recommended travel distances to be implemented in timber framed construction sites (prior to their protection during construction) are derived from STA Advice Note 5: *Design of escape routes during the construction process*, and these may significantly differ from those above.