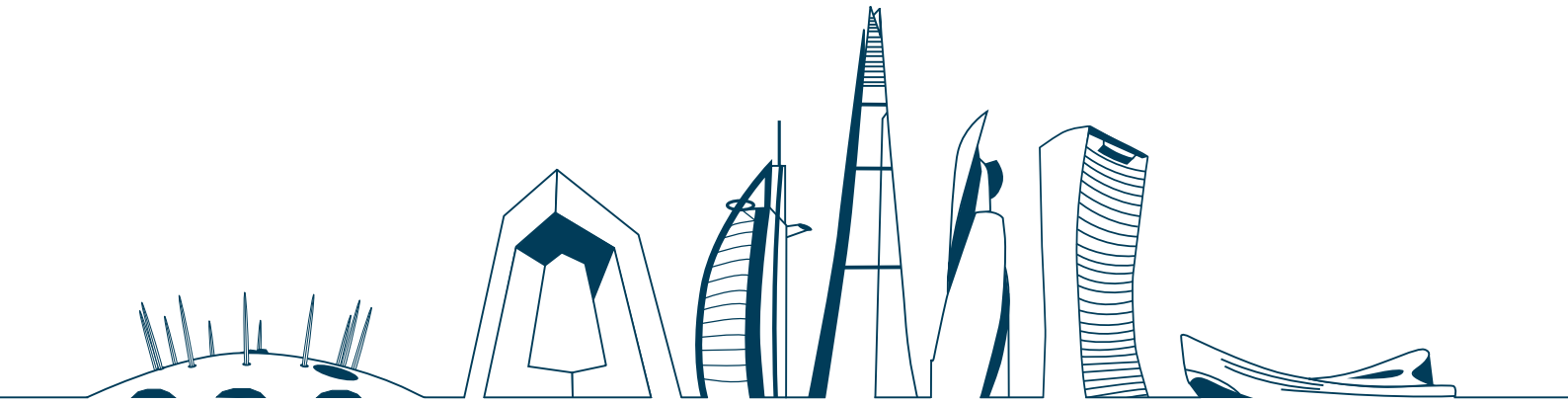
Guidance Note

Fire Industry Association



Scope of Works for the Fire Engineer

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NOTES ON THE USE OF THIS DOCUMENT

This document is intended to be distributed and used within the construction industry in order to assist with specifying the standard scope of works that would be expected from a fire engineer.

Each construction project is different and it is expected that this document will need to be modified as necessary prior to use on a specific project.

For example, whilst it is recommended that a fire engineer should be appointed throughout the design process, in some cases the appointment may only be for specific stages of design, eg if the job is re-tendered at a particular stage of design.

This scope of works is primarily intended for new-build construction projects, although it could be used as the basis for a scope of works on other projects such as refurbishments.

In this document the word 'Client' is used to refer to the organisation that the fire engineer will be working for.

In some areas, this document includes items where there are two or more possible options such as 'EITHER' and 'OR'. Before using this document, it would be necessary to clarify which of those options are to be used. For example, if the architect's scope of works includes the preparation of fire drawings, then the fire engineer's scope of works should be to assist in the production of those drawings, rather than to produce the drawings themselves. This document should then be modified as appropriate, prior to being issued for tender.

There are also some items which are noted as 'OPTIONAL'. These are mainly items where the work might, in some cases, be carried out by a third party. For example, a client may prefer for the fire risk assessment to be carried out by their in-house team, in which case that item should be deleted from this scope of works.

It is the client's responsibility to ensure that any fire engineer that they intend to use on the project is competent. The only industry-wide competence criteria that exists for fire engineering companies has been developed by the FIA Fire Engineering Council.

It is a criteria that is based on the employment of Chartered Engineers with appropriate skills in fire engineering. All companies that are members of the FIA Fire Engineering Council meet that criteria. Should the client choose to use a company that does not meet that criteria, they would need to make their own assessment of competence.

GENERAL

The fire engineer's overall role will be to provide advice in relation to the fire safety aspects of the design in order to provide reasonable confidence that the design that is developed, as well as the completed building, should achieve an acceptable standard of fire safety, comply with the client's objectives and meet all relevant legal fire safety requirements.

The fire engineer should co-ordinate with the design team in order to ensure that the other members of the team are aware of any fire safety design issues relevant to their responsibilities within the project.

In providing a quote in relation to the services listed below, the fire engineer should specify any limitations that have been assumed. For example, if the quote includes assumptions regarding the numbers of meetings or site visits during particular design stages, those should be stated.

The quote should also include details of any assumptions regarding specific fire engineering analyses, which may be included or excluded from the quote. If there are specific items of work for which, at the time of preparation of the quote, there is no certainty as to whether those items are needed, the quote should include those items as a separate price, or, if there is insufficient information available to provide a price, that should be clearly stated.

The primary aspects of responsibility for the fire engineer are as follows.

- Identify the fire safety design objectives for the project such as, but not limited to, identification of relevant statutory controls, confirmation of any client fire safety requirements, confirmation of any insurance requirements
- Work with the design team to develop the design to meet the fire safety design objectives
- Document the fire safety design in a fire strategy report
- **EITHER**: Produce relevant fire drawings
- **OR:** Assist the design team in producing relevant fire drawings
- Co-ordinate with any relevant third parties from whom approval is required, such as building control/approved inspector, fire service or insurers
- Review design documentation produced by others within the design team such as architectural design, M&E designs and tender documentation, to ensure that it complies with the objectives of the fire strategy
- **OPTIONAL** – During the construction phase, visit the site at intervals to monitor the construction process and ensure that the works are being carried out in accordance with the fire strategy
- During the construction phase, should changes to the design require changes to the fire strategy, update the fire strategy report as appropriate
- Verify that the final, as-built construction complies with the fire strategy
- **OPTIONAL** - Carry out pre-occupation fire risk assessment
- Produce relevant documentation for handover to tenant to ensure that they are aware of the fire safety design of the building and their responsibilities. This should, as a minimum, cover all information required to comply with Regulation 38 of the Building Regulations in England and Wales, and other appropriate legislation in other parts of the world.

The fire strategy should cover all relevant fire safety design issues, in particular:

- Design, location and protection of escape routes
- Identification and specification of all fire safety systems that are required
- Surface spread of flame requirements for surface materials
- Structural fire resistance requirements
- Fire compartmentation requirements including fire-stopping and cavity barriers
- External fire spread
- Access and facilities for fire services

The detailed design of the fire safety systems and precautions that are identified in the fire strategy should then be carried out by others in the design team, eg escape routes designed by the architect, fire alarm systems designed by the M&E engineer.

The fire drawings should correlate to the fire strategy report and vice versa. The contents of the fire drawings that are produced during the design development will vary project-by-project, but will typically include:

- Escape routes and travel distances in key areas
- Highlighted lines showing fire rating requirements of all walls
- Details of all fire doors, including fire performance and smoke seal requirements
- Location of all smoke ventilation systems and vents and any smoke or fire curtains
- Fire brigade access points into the building, including locations of any dry mains inlets and outlets
- Location of fire alarm panel(s)
- Locations of all refuges

On completion of the project, the information pack to be provided to comply with Regulation 38 of the Building Regulations, should include the fire strategy and fire drawings shown above, which should be updated to include 'as built' information regarding all the issues above.

Throughout the design, the fire engineer should identify any detailed fire engineering analyses that are required. At an appropriate stage of the design, the fire engineer should:

- Discuss the analyses with the relevant approving parties, eg client, building control/approved inspector, fire brigade, insurers and agree the acceptance criteria of the analyses
- Ensure that the analyses is carried out in accordance with the relevant acceptance criteria
- When the analysis is complete, circulate the conclusions and document the results in a report which should be submitted to the relevant approving authorities
- Co-ordinate with approving authorities to seek acceptance or, should changes be required, ensure that those changes are carried out and re-submit as appropriate

In relation to fire safety systems, the fire engineer should specify the fire systems that are required, the specification requirement for those systems and any specific aspects of those systems which apply to the particular building. The fire engineer should then coordinate with the M&E engineer as appropriate.

In relation to fire compartmentation, including fire stopping and cavity barriers, the fire engineer should specify the fire compartmentation requirements and ensure that those are detailed in relevant fire compartmentation drawings. As part of the optional services discussed later, the fire engineer would ensure that the architectural specification details those correctly and ensure that they are installed correctly.

The fire engineer should liaise with the CDM Co-ordinator and produce risk assessments of relevant issues, as required.

The detailed breakdown of these services between the different RIBA Stages of Work are shown below. Should the fire engineer only be appointed during later stages of the design, he or she should review and carry out , as appropriate, any outstanding issues from previous design stages.

RIBA 2013 STAGE 1 – PREPARATION (PREVIOUSLY RIBA STAGE A/B)

- Confirm the relevant fire safety design objectives for the project
- Identify relevant fire legislation which will affect the design, and
- Confirm any additional design requirements such as insurance or additional client requirements
- Highlight any significant constraints arising from the site such as fire service access, boundary conditions, water supplies and crowd dispersal, etc
- Obtain client approval to proceed with Stage 2

RIBA STAGE 2 – CONCEPT DESIGN (PREVIOUSLY RIBA STAGE C)

On an agreed drawing issue carry out a compliance check and identify any aspects of the design where changes would be required, or fire engineering analyses are needed.

Liaise with the client and design team (attend design team meetings, email and telephone correspondence, use of project intranet systems, etc) on a basis to be agreed specific to the project requirements.

In situations where there are different options in relation to a fire safety issue, carry out reviews of the implications of each option.

For the selected fire strategy concept design option, provide the client with preliminary calculations, design notes, sketches, details, etc that may be reasonably requested for costing purposes and for co-ordination of the fire strategy with the overall project design, including but not limited to:

- Occupancy loads and evacuation provisions
- Likely fire resistance and compartmentation requirements
- Fire fighting access and provisions
- Fire safety system requirements and features

Produce Stage 2 outline fire strategy report, outlining key fire safety principles and systems and circulate to the client and design team.

If required at this stage, advise and assist the design team in any negotiations with the statutory authorities necessary to obtain appropriate levels of approval in relation to fire safety.

Obtain client approval to proceed with Stage 3 including additional costs for any fire engineering analyses required.

RIBA STAGE 3 – DEVELOPED DESIGN (PREVIOUSLY RIBA STAGE D+)

Review the design documentation produced by others to ensure that it complies with the fire strategy. Identify any aspects of the design where changes would be required, or fire engineering analyses are needed.

Confirm the principles of the fire strategy with the design team.

Liaise with the client and the design team (attend design team meetings, email and telephone correspondence, use of project intranet systems, etc) on a basis to be agreed specific to the project requirements.

For the selected fire strategy concept design option, provide the client with calculations, drawings, design notes, sketches, details, etc that may be reasonably requested for costing purposes.

Consult with all relevant approving authorities: building control/approved inspector, fire brigade, insurer and stakeholders as appropriate. Address any concerns they may have and co-ordinate with the design team to ensure that the design is modified as appropriate.

If detailed fire engineering analyses are needed, co-ordinate with approving authorities to agree the scenarios and acceptance criteria, carry out those analyses and document the results in a report.

Circulate the report to the client, the design team and approving authorities. Continue liaison with approving authorities to address any issues that may be raised. Incorporate any outputs from the analysis into the design as appropriate.

On agreed architectural layouts, produce the Stage 3 fire strategy report providing sufficient information for specifications and detailed design to be developed by others.

EITHER: Produce fire drawings and circulate to the client and the design team

OR: Assist others in preparation of those fire drawings.

Obtain client approval to proceed with Stage 4, including additional costs for any further fire engineering analyses required.

RIBA STAGE 4 – TECHNICAL DESIGN (PREVIOUSLY RIBA STAGE E/F1)

Review the design documentation produced by others to ensure that it complies with the fire strategy. Identify any aspects of the design where changes would be required, or fire engineering analyses are needed.

If any further fire engineering analyses are required, or any which were not carried out earlier, these should be completed in this stage.

Liaise with the client and the design team (attend design team meetings, email and telephone correspondence, use of project intranet systems, etc) on a basis to be agreed specific to the project requirements.

OPTIONAL - Review the design and tender documentation which has been produced by others to ensure that it complies with the fire strategy (See Note 1).

Continue consultation with all relevant approving authorities, e.g. building control/approved inspector, fire brigade, insurer, as appropriate. Address any concerns they may have and co-ordinate with the design team to ensure that the design is modified as appropriate.

Update the fire strategy report in line with the current design.

EITHER: Update fire drawings in line with updated design,

OR: Assist others in updating of the fire drawings.

Assist the client in reviewing any fire safety aspects of tender submissions.

RIBA STAGE 5 – SPECIALIST DESIGN (NO PREVIOUS RIBA STAGE)

Carry out liaison, eg meetings, correspondence and use of project intranet systems, etc with the project team on a basis to be agreed specific to the project requirements.

OPTIONAL - Provide assistance to sub-contractors as they develop their designs to ensure that they comply with the fire strategy (See Note 1).

RIBA STAGE 6 – CONSTRUCTION (PREVIOUSLY RIBA STAGE J/K)

Carry out liaison, eg meetings, correspondence and use of project intranet systems, etc with the project team on a basis to be agreed specific to the project requirements.

Respond to any queries from the contractors in relation to the fire strategy.

Co-ordinate with approving authorities in relation to any issues relating to the fire strategy.

As reasonably requested by the client, visit the construction site and report to the client on compliance of the works with the design and, on completion of the works, comment on whether the works comply with the approved Fire Strategy.

EITHER: Carry out site inspections of installed fire precautions,

OR: Ensure that site inspections of fire precautions are carried out by an appropriately skilled third party.

See Note 2.

Attend commissioning tests of fire safety systems as appropriate to ensure that they are installed and operating in accordance with the fire strategy. In particular, this would include checks that the cause-and-effect of the fire alarm and related systems are correct.

OPTIONAL: Carry out pre-occupation fire risk assessment. **See Note 3.**

Update fire strategy report in line with as-built design.

EITHER: Update fire drawings in line with as-built design,

OR: Assist in the update of fire drawings in line with as-built design.

See Note 4.

RIBA STAGE 7 – USE AND AFTERCARE (PREVIOUSLY RIBA STAGE L)

NOTE: Typical construction contracts terminate at the end of Stage 6. Any work for the fire engineer during Stage 7 would typically be for the occupier of the building, which would be a separate contract. The information below is for information purposes.

OPTIONAL: Produce, or assist in the production, of organisational fire risk management policy, strategy and procedure.

OPTIONAL: Carry out fire risk assessments as required.

OPTIONAL: Provide support in relation to fire safety design as required.

NOTE 1
This item is identified as 'OPTIONAL' because it can be time-intensive work and so will increase the fire engineers' costs. However, the benefit is that it reduces the chances of errors in the tender documentation and therefore reduces subsequent contract variations if those errors are only identified once on site.

NOTE 2
The scope of any site inspections should be clarified in advance. The intention is for the fire engineer, at the end of construction, to be able to confirm that the as-built building is consistent with the fire strategy. That would require that the installation of all key fire safety precautions have been checked by an appropriately skilled third party, ie someone other than the person who installed it.

This would include:
- Fire compartmentation, including fire doors, penetration seals and cavity barriers
- Fire shutters and fire/smoke curtains
- Structural fire protection
- Fire alarm systems
- Sprinkler systems
- Other automatic fire suppression systems
- Emergency lighting
- Dry/wet fire mains
- Smoke ventilation systems
- Any other essential fire safety systems

During site inspections of the construction of compartment walls and other similar construction, the person carrying out the inspection should make reasonable efforts to inspect the construction. However, 100% inspection is considered impractical as, in practice, it would require regular opening up of construction. The site inspector should therefore identify any obvious non-compliances in relation to the compartmentation which would include areas in which fire stopping has not been completed correctly. This should include visual inspections into voids, above false ceilings and other similar locations.

Any tender which includes site inspections should specify the number and extent of site inspections that would be required.

NOTE 3

After occupation, the end user will have to carry out a fire risk assessment under the Regulatory Reform (Fire Safety) Order. If that identifies problems with the installed fire safety precautions, the contractor will need to revisit the site to carry out corrective measures. A pre-occupation fire risk assessment is not legally required (and so this item is listed as OPTIONAL) but carrying out a pre-occupation fire risk assessment will significantly reduce the risk and costs of corrective actions being required post-occupation.

NOTE 4

The as-built fire strategy and fire drawings are needed as part of the information that the lead contractor is required to provide for compliance with Regulation 38 of the Building Regulations. Further information on the information needed to comply with Regulation 38 is to be produced in separate guidance.

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