



ASFP Technical Guidance Document – TGD 18

Code of practice for the installation & inspection of fire resisting duct systems

FIRE AND YOUR LEGAL LIABILITY

Fire losses in the UK were £1.1bn in 2011. That's why we must all play our part.

Why is this of relevance to me?

If you are involved in provision of a fire protection package, at any level, then you share liability for its usefulness and its operation when it's needed in fire, and that liability will still be there in the event of a court case.

I place the order; it is not my responsibility to install the works!

If it is your responsibility to specify the materials and/or appoint the installation contractor, it is also your responsibility to ensure that they can prove competency for the fire protection materials used, or the works to be carried out. It's no longer simply a duty of care or voluntary – it's a legal obligation.

If you knowingly ignore advice that leads to a failure in the fire performance of any element of installed fire protection within a building, then you are likely to be found to be just as culpable as the deficient installer.

You share liability for the provision of information required under Building Regulation 38 that tells the user of the building about the fire prevention measures provided in the building. Otherwise, the user cannot make an effective risk assessment under the Regulatory Reform (Fire Safety) Order 2005, the Fire Scotland Act 2005, and the Fire & Rescue Services (Northern Ireland) Order 2006.

What is expected of me?

In the event of fire, and deaths, a court will want to know how every fire protection system was selected; the basis for selection of the installer, whether adequate time was provided for its installation, and whether there was adequate liaison between the different parties to ensure it was installed correctly. No ifs, no buts – it's all contained in the Construction, Design and Management Regulations 2007.

The CDM 2007 regulations, enforced by Health and Safety Executive concentrate on managing the risk, and the health and safety of all those who build, those that use the building, those who maintain it and those that demolish it – cradle to grave.

Be aware – the time to consider the above is before the event, not after it!



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The Association was formed in 1976, and currently represents the majority of UK contractors and manufacturers of specialist fire protection products, with associate members representing regulatory, certification, testing and consulting bodies.

ASFP seeks to increase awareness and understanding of the nature of fire and the various forms, functions and benefits provided by passive fire protection.

It is willing to make available its specialist knowledge on all aspects of fire protection and can assist designers and main contractors in identifying products suitable for specific requirements, both in the UK and related overseas markets.

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The BECA represents the interests of firms active in the design, installation, commissioning and maintenance of heating, ventilating, air conditioning and refrigeration products and equipment

“Cautionary note to all ductwork designers and manufacturers

Ductwork constructed to DW144 standard has no fire resistance. General purpose ventilation/air conditioning ductwork and its ancillary fire items do not have a fire rating and cannot be either utilised as, or converted into fire rated ductwork, unless the construction materials of the whole system, including supports and penetration seals are proven by test and assessment in accordance with the appropriate test standard. In the case where galvanised sheet steel ductwork is clad with the application of protective material, the ductwork construction must be as tested and comply with the manufacturers recommendation, e.g. gauge of ductwork, frequency of stiffening and non use of low melting point fasteners and rivets. Sealants, gaskets, and flexible joints should be tested and certificated in accordance with the appropriate test standard and comply with all manufacturers recommendations. Careful consideration must be given to the maximum certificated size as tested and the manufacturer's recommendation should always be followed.”

Acknowledgements

This document complements the 2nd Edition Volume 2 of 'Fire resisting ductwork' (BS 476 Part 24 test data) and 1st Edition of Fire resisting ductwork (EN 13501 Parts 3 & 4 classifications). It has been prepared by ASFP Task Group 6A Fire Resisting Ductwork whose contributions are gratefully

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AMENDMENT SHEET: ASFP Code of practice installation and inspection of fire resisting ductwork

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Note 1. Amendments may only be inserted by ASFP Secretariat with approval of the ASFP Technical Officer.

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1 INTRODUCTION

This Code of Practice has been written to assist installers and others involved in the installation and inspection of fire resisting duct system. The aim of the code is to ensure that installed fire resisting duct system will perform as required in the event of fire and will continue to do so for a reasonable period during the life time of the building.

All fire resisting duct systems must be installed in accordance with the manufacturer's fire tested system.

The ASFP has produced other Codes of Practice for the installation of passive fire protection products including fire stopping systems and fire protection to structural steelwork.

1.1 Scope

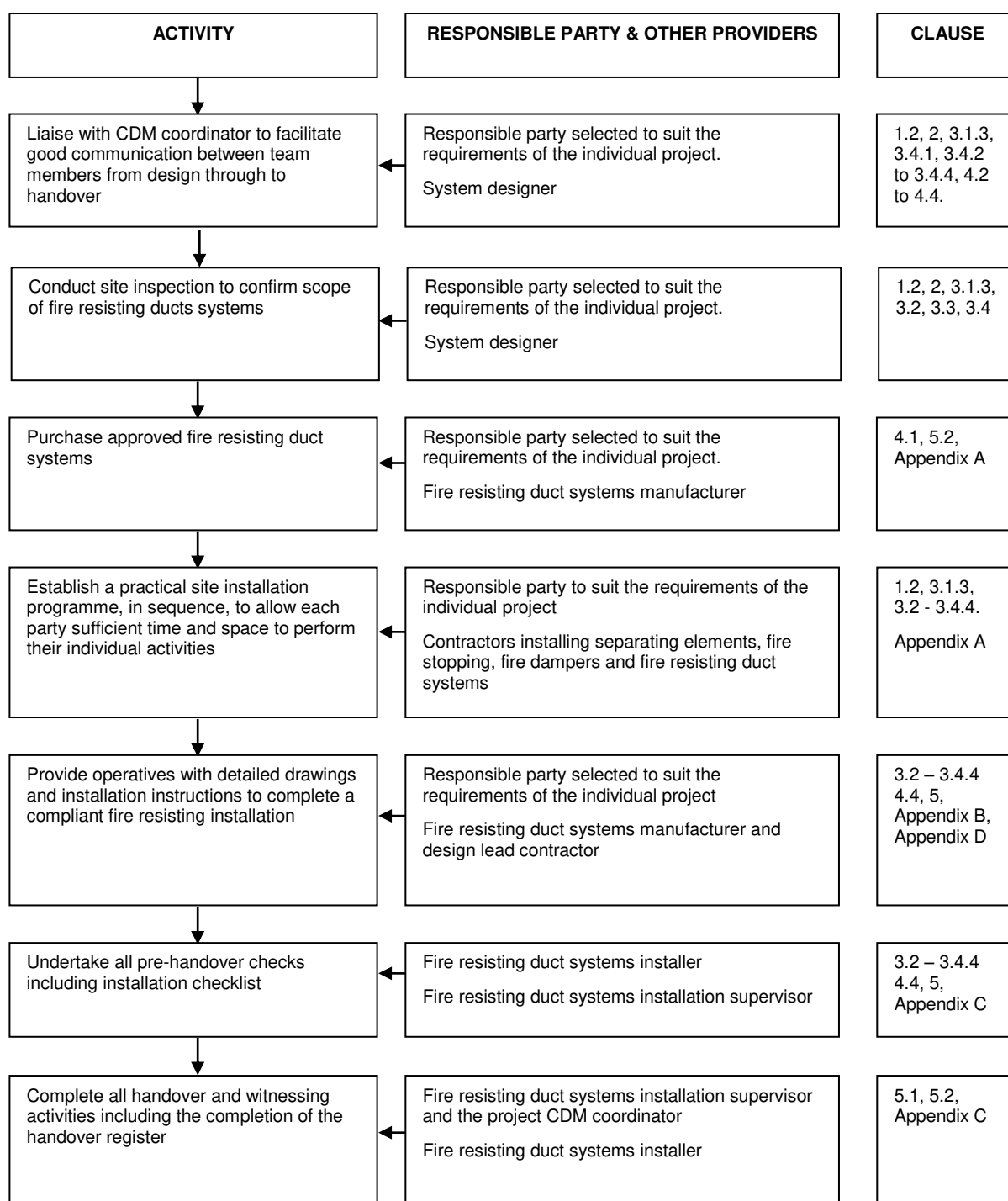
This code of practice provides guidance in the installation of fire resisting duct system.

Detailed technical information on the design, testing, certification and regulations pertaining to fire resisting duct can be found in the ASFP 'Blue Book' publications Fire resisting ductwork tested to BS476 Part 24 2nd Edition⁽¹⁾ and Fire resisting ductwork: classified according to BS EN 13501 Parts 3 and 4⁽²⁾.

It is essential that this Code of Practice is read in conjunction with the appropriate version of the Blue Book as this contains all the technical information that supports the fire resisting duct system being installed.

The latest version of each book is available as a free download from www.asfp.org.uk/publications.

1.2 The installation process flow chart



2 DEFINITIONS

All commonly used definitions are given in the relevant version of the ASFP Blue Book and are not repeated here. Additional definitions of terms used in this document are given below.

CDM Coordinator:

A person appointed by the client under the Construction (Design & Management) Regulations 2007⁽³⁾ for the duration of the project to:

- coordinate the health and safety aspects of design work
- facilitate good communication between all team members
- liaise with the principal contractor regarding ongoing design
- Identify, collect and pass on pre-construction information

Contract administrator:

The person responsible for co-ordinating the various requirements of the contract to ensure that all documentation is completed and in order. The contract administrator may be a nominee of the client or specifier, but more usually would be appointed by the contractor.

Designer:

The consultant or engineer responsible for designing the fire resisting duct system and producing the fire safety manual.

Installer(s):

The company or companies responsible for installation of each stage of the fire resisting duct system.

Method statement:

A method statement is a document detailing how a particular work item will be carried out. It should include details of the possible dangers/risks associated with the work, the methods of control to be established, and how the work will be managed.

Responsible person:

Responsible person is defined in several ways under the Regulatory Reform (fire Safety) Order⁽⁴⁾:-

[a] In relation to a workplace, the employer, if the workplace is to any extent under his control.

[b] In relation to any premises not falling within [a]

[i] The person who has control of the premises (as occupier or otherwise) in connection with the carrying on by him of a trade, business or other undertaking (for profit or not), or

[ii] The owner, where the person in control of the premises does not have control in connection with the carrying on by that person of a trade, business or other undertaking

Specification:

The specification is the detailed fire protection requirement as defined for all elements of the structure. It may allow the use of an approved product or nominate a preferred supplier for the fire protection system, in accordance with instructions from the client.

Specifier:

The person or company who issues the specification for fire resisting duct system.

System designer

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The person or company responsible for placing the order for the fire resisting duct system

System Manager

The system manager who organises with the system designer the management of:

- Manufacture
- Installation
- Insulation Contractor
- Fire Stopping Contractor
- Draughtsman/Engineer

to bring together a completely fire resisting duct system. This may be one company carrying out all the stages and therefore a single source responsibility.

3. INSTALLATION OF FIRE RESISTING DUCT SYSTEMS ON SITE

3.1 Management of installation at site

3.1.1 Choice of specialist installer

Installation of fire resisting duct systems is usually undertaken by companies specialising in that activity. When considering using an installer, you should be aware of the following:

Approved Document B Volume 2⁽⁵⁾ states

'Since the fire performance of a product, component or structure is dependent on satisfactory site installation and maintenance, independent schemes of certification and registration of installers and maintenance firms of such will provide confidence in the appropriate standard of workmanship being provided'.

The Scottish Technical Handbook⁽⁶⁾ states that workmanship is considered compliant if:

the workmanship is covered by a scheme, which complies with relevant recommendations of BS EN ISO 9000: Quality Management and quality assurance standards (there are also independent schemes of accreditation and registration of installers of materials and products that provide a means of ensuring that the work has been carried out by knowledgeable contractors to an appropriate standard);

The use of independent certification schemes provides clients and specifiers with confidence regarding the competence of potential contractors; it helps them to fulfil their own duty of care responsibilities under the CDM regulations and it gives the 'responsible person' confidence of compliance with the Regulatory Reform Order and national equivalents.

The ASFP strongly supports the use of specialist third party certificated installers and consequently requires all ASFP installer/contractor members to hold third party certification.

The use of non-specialist installers is not recommended because they cannot provide the same level of assurance using a specialist third party certificated installer.

3.1.2 Design Review

Prior to commencement of installation at site, a design review should have been carried out to confirm that no alterations to the design have been made that might affect the drawings and hence the products and components to be installed. If alterations have been made then these need to be assessed by a suitably qualified person e.g. the fire resisting duct systems manufacturer, a fire safety engineer, a certification/testing body or any combination of these. It may also be necessary to obtain approval from Building Control and/or for the local Fire Authority to be involved.

The detailed make up of the fire resisting duct system will normally be the responsibility of the fire protection installer who will usually prepare the detail in conjunction with the manufacturer, and in accordance with 3rd party Certification requirements. The ASFP 'Blue Books' provide data and product information for most applications.

Any discrepancies should be highlighted to the Contract Administrator, Designer and Specifier for clarification.

3.1.3 Health and safety issues

Ensure that all works are planned and undertaken in line with current H & S legislation, observing specific site conditions and any manufacturer's literature. This includes being in compliance with the main contractors health and safety work plan.

Attention is drawn to HSE guidance on health and safety in construction sites document HSG 150⁽⁷⁾

If compliance with or membership of the Contractor Health and Safety Assessment Scheme ⁽⁸⁾ this should be checked.

The installer must ensure that all relevant Health and Safety data sheets, application instructions and method statements are available to the application operative(s) and client & that they are fully understood.

3.2 Information to be provided to the installer

Technical information to be provided by the system designer to the fire resisting duct system installation company or companies comprises:

- Duct manufacturers test data sheets and dimensionally detailed technical illustrations.
- System designers' project-specific detailed and dimensioned arrangement drawings incorporating insulation where required, compartment barriers and penetration seals.
- System design drawings marked with identification codes which cross reference back to a schedule of all ducts to include their rating and location.
- Duct support arrangements
- Duct to damper connection details including any specific requirements for fixings, joints, and fastenings.
- Location of first duct support relative to the damper centreline – for both sides of the damper.
- Activity programme clearly detailing the sequence of installation relative to each contractor.
- Any additional or special requirements.
- Inspection and handover requirements

An Installation Check List can be found in **APPENDIX B**.

3.3 Sequence of installation

On receipt of the project-specific drawings detailing the fire resisting duct system arrangement, it will be necessary for the designated principal contractor to establish a coordinated programme for the installation sequence for the barrier, the duct, fire dampers, any insulation and the and penetration seals. The involvement of the CDM coordinator is strongly recommended.

3.4 Installation considerations

For a cost efficient and successful installation, it should be recognised that issues can occur and that they should be overcome with the continued involvement of the CDM coordinator. All those involved have the responsibility of addressing and resolving unexpected issues and ensuring that work-in-progress inspections are conducted to ensure that a final inspection before handover to either the commissioning team or the client will not result in any corrective action having to be instigated. An especially important consideration is to ensure that there is adequate access to be able to safely install the fire resisting duct system.

3.4.1 On-site modifications

During installation, issues can arise that might need either a revised or 'non-standard' solution. These can only be introduced by the designer who should take advice from the fire resisting duct system designer or a fire safety engineer or a certification/test body or any combination of these. It may also be necessary to obtain approval from Building Control and/or for the local Fire Authority to be involved.

Untested/unapproved modifications may not provide the appropriate fire resistance and dealing with the problem before installation will prevent remedial action being required later.

Where site conditions differ from those covered by the certification or test evidence, the system designer and installer will need to consider whether the certification or test evidence is appropriate and take appropriate guidance as above.

3.4.2 Work-in-progress inspections

The CDM coordinator and designer must monitor compliance with the project-specific design and ensure that the work-in-progress is regularly inspected in accordance with the installers approved method statement and the system design.

3.4.3 Pre-handover activities

It is in the interest of the whole team that pre-handover inspections by the fire resisting duct system installer and the hand-over itself are based on an agreed check list. A typical Installation Check List can be found in **APPENDIX B**.

3.4.4 Final inspection

At the outset of their involvement, all team members must be made aware of the intended final inspection and certification regime. The final installation must be checked for compliance by the designer and CDM coordinator.

All final inspections must be documented in a handover register that must be retained by members of the team responsible for system design and installation.

A typical Inspection and Handover Check List can be found in **APPENDIX C**

4. QUALITY, INSPECTION AND MAINTENANCE

4.1 Product quality assurance

The manufacturer of the fire resisting duct system will be able to provide evidence of product quality and fitness for purpose e.g. if they hold ISO 9001⁽⁹⁾ Quality Management System certification via a UKAS accredited certification body.

Products listed in the ASFP BS Blue Book may also be third party certificated by a UKAS accredited Certification body which assess the performance or quality of the product/system. Third party product certification bodies undertake audits specifically on fire protection and consistency in the manufacture, testing and batch approval process, where relevant.

UKAS accredited third party product certification is a requirement for listing of products in the ASFP Blue Books- UKAS accredited third party product certification and specialist contractors are now favoured by Building Regulations.

AD-B states:

“Confidence that the required level of performance can be achieved will be demonstrated by the use of a system, material, product or structure which is provided under the arrangements of a products conformity certification scheme...”

The ASFP strongly recommends the use of products which have been third party certificated.

CE Marked Products

At the time of publication of this document a harmonised product standard (hEN) for fire resisting duct sections (prEN 15871) has been rejected under the CEN process. Until a new standard is approved it will not be possible to CE mark fire resistant ventilation duct sections. However, fire protective products for fire protection of ventilation ducts, steel structures, and other works on site can be CE marked in accordance with ETAG 018 on a voluntary basis.

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4.2 Installer quality assurance

Verification of the quality of installers of fire resisting duct systems is best demonstrated by the installer holding third party installer certification. Requirements for third party installer certification schemes typically include:

- Verification of the skills of operatives
- Verification of ability to evaluate suitable products and identify mismatched products or proposed designs that will not work
- Registration of operatives and supervisors
- Planned and random inspection of installations
- Issuing of certificates of conformity on completion
- Audit trail of materials used in each job

The use of non-specialist installers is not recommended because they cannot provide the same level of assurance using a specialist third party certificated installer.

4.3 Site inspection criteria

Pre-handover and final inspection of the completed installation is a requirement of this code of practice. To undertake such an inspection example checklists are provided in appendix B and appendix C. If an independent inspection is required e.g. for a special project or for a safety critical installation, then installations are often inspected by independent third party inspectors. Such inspectors may use the following methodology:

4.3.1 Proportion and frequency to be inspected

In order to ensure confidence in the completed installation it will be necessary to undertake inspections. Ideally all installations should be inspected, but sometimes this is not practicable or possible. If after inspecting a percentage of the installation there are no significant defects, then it can be assumed that the remainder are probably satisfactory. Conversely, if defects are found that could affect the fire performance, more inspections will need to be undertaken until the inspector is confident that remaining uninspected installations are satisfactory. The matrix below is a suggested protocol for inspections.

Time of Inspection	Minimum % to be inspected	Responsibility	If significant defects are found	Form used
During installation	100%	Installing Contractor	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix B
At handover	20%* or greater of each type of duct system and throughout the building	CDM Coordinator / Client's Representative	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix C
After other building work in area of fire resisting duct system	100% of areas where other work impacts on fire resisting duct system	Building Manager (Responsible Person or a designate)	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix B
Annually e.g. as part of an assessment under the RR(FS)O etc	All areas adjacent to or forming escape routes	Responsible Person (who may employ a sub-contractor)	Report to Responsible Person who should employ specialist inspectors to undertake full, possibly invasive inspection	Appendix B or ASFP Guide to inspecting PFP for Fire Risk Assessors ⁽¹⁰⁾

*Note: If a third party certificated installation contractor has been employed, this may be reduced to e.g. 5 - 10%.

4.3.1 Other inspection criteria

- There is a need to consult the manufacturer and or system designer rather than installer as to what to check and for the original specification. Consult with system designer to find out the parameters they are inspecting to.
- Method of inspection
Inspection is usually visual, but may include a leakage test as part of the commissioning of the duct system e.g. as part of that required by DW 143 A practical guide to Ductwork Leakage Testing.
- Recording of results of inspection including any deviations/problems.
These can be recorded on forms following the format in appendix B.

4.4 Site remedial work

Where products/system have been installed in a way which deviates from the installation drawings e.g. if conditions or site limitations make it necessary, these needs to be identified so that remedial works can be undertaken as required.

4.5 Inspecting pre-installed fire stopping in existing buildings

When fire resisting duct systems have been installed for some time in an existing building, the inspection agency e.g. a fire risk assessor will need access to records of all the installations in the building. These should be available as part of the Regulation 38 information required under the England and Wales Building Regulations. Where no records exist, the inspector's role is much more difficult and consultation should be taken with the responsible person. The need to inspect fire resisting duct systems results from the Regulatory Reform (Fire Safety) Order⁽⁴⁾, the Fire Scotland Act 2005⁽¹²⁾, and the Fire & Rescue Services (Northern Ireland) Order 2006⁽¹³⁾, whereby those fire measures which protect life safety are required to be evaluated as part of a fire risk assessment.

4.6 Maintenance

Periodic inspections should be carried out as part of the normal maintenance plan for the building and any missing or damaged fire resisting duct including penetrations should be repaired or replaced in accordance with the system designer's instructions. Periodic maintenance will also include:

- Cleaning of internal surfaces of ducts (especially kitchen extract ducts)
- Visual inspection of ductwork and any penetrations in walls and ceilings
- Alterations made to the fire resisting duct system by other trades throughout the life of the building
- Leakage testing
- Operation of fire and smoke dampers as appropriate

Detailed guidance on the maintenance of fire resisting ducts is given in annex W of BS 9999: 2008⁽¹⁴⁾

5.0 RECORDS AND REPORTS

Detailed and accurate records are an essential contract requirement. Information should be kept available until handover to the client is completed. These documents shall be forwarded to the designer on completion of the project for inclusion in the fire safety manual.

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Where appropriate, site records should contain the following information:

- Verification of Product and Specification
- Basic Contract Information
- Contract documents for installation of the fire protection product.
- Quality Control Records
- Third Party Accredited Certificate of Conformity

5.1 Regulatory Reform (fire Safety) Order

Under the Regulatory Reform (Fire Safety) Order 2005⁽⁴⁾ the 'responsible person' (who may be the manager of the building owner, designer or architect, specifier or contractor) is responsible for making and maintaining a fire risk assessment and for being compliant with current legislation relating to the fire protection of persons in and around the building.

A legal duty and liability arises under Regulation 38 of the Building Regulations (England and Wales) ⁽¹¹⁾ to provide details of all fire precautions to the client so that the Responsible Person can carry out the required statutory duties. Regulation 38 of the Building Regulations is specifically referenced in Appendix G of Approved Document B, and requires that fire safety information shall be given to the 'responsible person' - as defined in the Regulatory Reform (Fire Safety) Order 2005 at the completion of the project or when the building is first occupied.

Similar requirements are incumbent upon the Duty Holder (Scotland) and the Appropriate Person (Northern Ireland) under the Fire Scotland Act 2005⁽¹²⁾, and the Fire & Rescue Services (Northern Ireland) Order 2006⁽¹³⁾ respectively.

The ASFP has published a Guide to inspecting Passive Fire Protection for Fire Risk Assessors ⁽¹⁰⁾ that gives further information on which elements of passive fire protection need to be inspected to comply with the legislation referred to above.

5.2 Contract document checklist

Compliance with this process and contract checklist will provide confidence that the fire resisting duct system has been correctly installed and that the relevant statutory requirements have been diligently and responsibly complied with.

PROCESS REQUIREMENT	DOCUMENTARY EVIDENCE
Design requirements & Suitability of Product and Specification	1 ^o - 3 rd Party Certificated product (+ Blue Book listing if appropriate) that meets required fire performance 2 ^o – Fire test and assessment evidence to meet the fire performance required Supplier confirmation of fitness-for-purpose for service environment and life to first maintenance Building Control acceptance of design
Correct and Complete Contract Documentation	Complete / accurate contract details Contract Validation Check List (Appendix A) Complete / accurate information as defined in 3.2.
Quality of Site Application	3 rd Party Certificated installer or installers Management of the whole fire resistance duct system Method statement(s) and inspection plan. Design review to confirm no changes from that agreed and approved by the Designer and Building Control
Verification of installed installation	Installer's Installation and Hand-over checklists (Appendices B & C) Completed inspection plan Corrective action records (if required) 3 rd Party inspection report (if applicable). Project finalisation and signing off.

APPENDIX A Contract validation checklist

Process Stage	Key Criteria	Requirement / Evidence
1. Design requirements	Is the basis for fire resistance rating defined?	AD-B or BS 9999 or insurance design code
2. Product Testing and Assessment	Is the product fully tested and approved for fire resistance?	BS or EN test data, CE-mark - Third party certificated manufacturer plus Blue Book listing.
3. Contract specification	Will product satisfy all design requirements for project?	Manufacturers written confirmation
	Are any fire engineered assessments included and are these correct?	Independent fire-engineer's assessment to agreed guidelines
4. Technical & Installation Contractor competence	Is the installer competent in his understanding, installation and quality control of fire resisting ducts?	Contractor audit, or third party quality management system to ISO 9001:2008 registered for the system being used
	Are the installer's site supervisors and operatives competent in all aspects of product installation?	Competency evaluated through third party certification and manufacturer's certification.
	Does the installer have a complete understanding of the particular project, and a working plan to deliver contract requirements in full?	Contract schedule, technical supporting evidence, method statement(s) and information given in 3.2
	Is independent inspection of the installer's work necessary to validate the installation of fire protection?	Not if a third party certificated contractor
	Correct sizing of supports	Proof of calculations
	Are site Health & Safety measures properly covered?	Contractor Safety Policy, project risk assessments and method statements Should include compliance with site storage and waste disposal regulations ^(12 & 13) . Compliance with / membership of the Contractor Health and Safety Assessment Scheme or another if applicable. Product Safety Data Sheets
5. Audit trail & Contract Documentation (required at start-up)	Evidence that all above requirements are met.	Existence and quality of documents and supporting evidence.
	Other contract specific requirements.	Supporting documents Product Technical Data Sheets etc.
6. Completed project documentation.	Start-up documentation	Copies of all relevant documentation from the above.
	QA records etc.	Completed Quality and Inspection plan (or equivalent) plus supporting detailed records from site.
	Problems, faults requiring rectification during the course of the contract, corrective actions and concessions.	Documented evidence of any problems and actions taken, including all correspondence, justification, supporting evidence, manufacturer recommendations etc and authorisation of action.
	System validation.	Independent survey report (if any)
	Conclusion	Project finalisation and signed off

APPENDIX B Installation Check List (to be completed by the installer)

No.	Question	Responsibility	Guidelines
01	Has all the necessary technical information been made available for the duct installer and all other associated trades?	System Designer, System Manufacturer	Refer to Clause 3.2
02	Has a project-specific programme of sequenced installation activities been prepared?	System Manager.	An acceptable sequence to achieve the same design criteria can vary from project to project
03	Does the programme sequence of other trades allow for there being sufficient space on all four sides of the duct to fit associated support systems, apply fixings and complete penetration seals	System Manager.	Inaccessible voids and cavities caused by adjacent walls, columns and structural soffits shall be considered during programming.
04	Does the programme sequence ensure that there are no other services installed that would prevent the ductwork arrangement being fitted as per the system design?	System Manager.	Other trades cannot 'share' the openings for ducts and their penetration seals.
05	Does the programme sequence ensure that there are no ceiling grids / tiles installed that would prevent ease of installation for all associated contractors?	System Manager	
06	Have solutions to any necessary on-site change to the installation sequence been transmitted back to the programmer so that future projects will benefit?	Duct installer, Insulation contractor, Barrier contractor, Penetration seal contractor.	Altering the sequence of one or more contractors in order to achieve the design in a more practical manner shall be communicated back to the programmer for use on future projects.
07	Has the system designer approved any ad-hoc instructions issued by a third party? e.g. The 'ad-hoc' insertion of stone mineral wool, or similar, in cavities	Duct installer, Insulation contractor, Barrier contractor Penetration seal contractor.	The inclusion of non-specified products, material and dimensional modifications may result in the invalidity of the final assembly
08	Is the fire stopping tested and approved for the type of barrier that is being used?	Penetration Seal Contractor Duct Manufacturer	Assemblies associated with block work may not be suitable for dry-lining
09	Are any openings in dry-lined barriers correctly formed, trimmed and lined?	Barrier Contractor	Do trimming members need to be tied back to the soffit and slab?
10	Prior to installation are method statements, COSHH assessments and risk assessments available to the installers?	Duct installer, Insulation contractor, Barrier contractor Penetration seal contractor.	The availability of clear instructions to the installers is essential in ensuring correct installation methods are adopted.
11	Has the duct, any damper and penetration seal been installed as per the specification?	All parties.	Query before installation if any element appears to be non-compliant
12	Has adequate space been provided to allow for access to the duct for maintenance and cleaning purposes?	Designer and System Manager	Consider access on both sides of the ductwork for maintenance and future cleaning purposes especially on kitchen extract systems.

APPENDIX C Inspection and Handover Check List

(To be completed by the CDM coordinator or Designer)

No.	Question	Responsibility	Guidelines
01	Is the fire resisting duct system the correct type?	System Designer.	Confirm the duct is the correct type i.e. smoke extract, kitchen extract, ventilation
02	Are the ducts correctly identified?	System Designer or Commissioning Engineer	Any unique system identification or plant item number must be clearly indicated on the ductwork or agreed location.
03	Are the ducts located correctly?	Fire resisting duct system Installer.	The duct position shall be dimensionally checked against the installation drawings / details.
04	Have supports for the fire resisting duct system been installed in accordance with the approved method?	Fire resisting duct system Installer.	Fire resisting duct manufacture
05	Is access, especially to the kitchen extract duct including access doors unobstructed?	Duct Installer to advise System Designer if problems are foreseen.	Unobstructed space shall be provided for safe access to duct system. Also consider access through ceiling voids and adjacent services.
06	Has the space around the duct, and within the penetration, been left clear and not been used for the passage of other services?	Duct Installer to advise Lead Contractor if problems are foreseen.	The presence of other services will invalidate the installation method.
07	Has the duct been checked. No other trades are hanging from the fire duct.	Fire resisting duct system Installer.	Inspection for damage.
08	At the time of the fire resisting duct handover, is the fire insulation barrier and penetration seal complete?	Duct Installer.	Duct installer to record on the handover register if any following trades have still to complete their activities.
09	Is the duct installation completed and available for handover prior to system commissioning?	Duct Installer.	Obtain relevant acceptance of the duct installation from the CDM coordinator
10	Is the completed handover register cross referenced back to the identification codes listed in the system designer's duct schedule?	Duct Installer.	

APPENDIX D Dos and Don'ts of installation fire resisting duct systems

In addition to the items listed below BRE publication GBG 81 Good Building Guide 81⁽¹⁵⁾ – Installing fire resisting ductwork and dampers gives sound guidance on the installation of fire resisting ductwork

Pre-installation checks

- Ensure that the fire resisting ductwork system you are installing is suitable for the end-use application. Critical checks are:
 - that the fire resistance period provided by the duct system is as specified
 - that the penetration seal is suitable for the type and size of duct
 - that the separating construction (wall or floor the ducts penetrates) is constructed correctly and that the aperture for the duct is suitable e.g. correct size and in good condition
 - that a suitable penetrations seal is provided around the outside of the duct
 - that a suitable fire or smoke damper is provided at the separating element (if required)
- Site conditions may not be ideal for installation. Identify any problems which may require attention where the fire resisting duct system is to be installed (for example an unstable/unsecured structure which may need to be made good before proceeding)

Examples:

- All fire resisting ducts should be suitably supported either side of the wall to prevent collapse and break of the seal under fire conditions.
 - All Drywalls through which ducts pass must be built correctly. Plasterboard manufacturers' literature state that the hole must be framed with the stud work and then generally lined with plasterboard. Unless this is the case the duct cannot be installed correctly as the wall is deficient
 - Ducts should be independently secured, so that in a fire they do not affect the stability of the surrounding firestop, unless the stop is designed to support them. This should be clarified with the manufacturer
- Confirm the materials and components to be used in the installation of the fire stopping or penetration seal system are present

Example:

- Never mix one manufacturers product e.g. batt with another manufacturers product e.g. mastic, this is not a proven system and therefore cannot be assumed to work
- Ensure you have the manufacturer's installation instructions to hand

Installation

- Erect the fire resisting duct system materials and components in accordance with the manufacturer's installation instructions
- Install the fire resisting ductwork in accordance with the manufacturer's instructions

Examples:

- Check and if required carry out repairs to any damaged / defective elements of the fire stopping or penetration seal system or fixings following approved methods to provide complete/secure passive fire protection

- Clear the completed work area, dispose of any waste products safely, remove surplus materials, tools and equipment
- Confirm the fire resisting duct system is complete to instruction and specification. You may be required to fill in a certificate of conformity and/or an inspection and handover checklist (appendix C) for this.

APPENDIX E REFERENCES

1. ASFP 'Blue Book' – Fire resisting ductwork tested to BS476 Part 24 2nd Edition. www.asfp.org.uk
2. ASFP 'Blue Book' – Fire resisting ductwork: classified according to BS EN 13501 Parts 3 and 4. www.asfp.org.uk
3. Construction (Design and Management) Regulations 2007: Statutory Instrument No 320
4. The Regulatory Reform (Fire Safety) Order 2005. Statutory Instruments No. 1541
5. Approved Document B: 2006 – Fire Safety, Volumes 1 and 2
6. The Building Scotland Regulations 2004. Technical Handbook [Fire] 2005 for domestic and non-domestic buildings
7. Health and Safety in Construction third edition <http://www.hse.gov.uk/pubns/books/hsg150.htm>
8. Contractor Health and Safety Assessment Scheme – www.chas.gov.uk
9. BS EN ISO 9001:2000. Quality management systems – BSI
10. ASFP Guide to Passive Fire protection for Fire Risk Assessors. www.asfp.org.uk
11. The Building Regulations 2000 [SI 2000/2531] for England and Wales
12. Fire Scotland Act 2005
13. Fire & Rescue Services (Northern Ireland) Order 2006.
14. BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.
15. BRE GBG 81 Good Building Guide 81 – Installing fire resisting ductwork and dampers.