



**BS 476 Part 24
Fire Rated & Smoke
Extract Ductwork
Systems**

Installation Details



Introduction

AMS AIR MOVEMENT SUPPLIES

AMS Air Movement Supplies has served the Irish market under many names since 1998. We offer a complete package that is unrivalled as we are the only Irish manufacturer of grilles, dampers and fire rated ductwork. Our 40,000 sq. foot warehouse contains a vast array of diffusers, fans, flexibles and channels. Our turnaround times are renowned and we are acutely aware how much time costs to a delayed contractor.

We are **ISO 9001** certified and have completed an FPC (Factory Production Control) audit which is appraised annually and ensures the quality of all our products. Adherence to strict environmental protection policies and resource efficiency in materials have made us one of the lowest producers of metal waste in Ireland.

TECHNICAL SUPPORT AND TRAINING

AMS Air Movement Supplies know the importance of getting a suitable fire system and have been involved with testing for over 15 years. We therefore provide a technical support service to all our clients and can provide a Continuing Professional Development (CPD) session on the latest regulations for your staff.

PRINCIPALS IN DESIGN AND CONSTRUCTION

SUREFIRE is the product of many years of on-site experience and has deliberately used flanges, stiffeners and threaded rods interchangeably in strengthening to provide flexible solutions on-site where space and other criteria make fitting difficult. It is abundantly obvious to most that height is always at a premium and this flexibility allows us to minimise the height requirements for **SUREFIRE** fitters by replacing stiffeners with threaded rods where needed.

Please contact us directly at sales@airmovementsupplies.ie.

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Items available as Standard.

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SureFire Projects Completed (formerly SAFE4)

1. Dublin Airport, Dublin
2. Jervis Street Shopping Centre, Dublin
3. Rose Bowl Stadium, Southampton
4. Titanic Quarter, Belfast
5. Cherrywood Southeast Town Centre (TC4), Dublin
6. Eir, Dame Lane, Dublin
7. Hotel Café Royale, London
8. Google Gordon House, Dublin



SUREFIRE Non-Coated Steel Ventilation, Smoke Outlet and Kitchen Extract Ductwork Systems

1. This approval relates to the use of the above non-coated ductwork systems in providing fire resistance of up to 240 minutes stability and integrity (duct A fire attack from outside the duct and duct B fire attack from inside the duct) and up to 180 minutes insulation (duct A) and up to 60 minutes insulation (duct B), as defined in BS 476: Part 24: 1987 (ISO 6944: 1985) and following the heating regime of ISO 834 - 1975. Subject to the undermentioned conditions, the ductwork systems will meet the relevant requirements of BS 9999 for fire resisting compartment ductwork systems, for periods of up to 240 minutes (dependent upon design limitations) when used in accordance with the provisions therein.
2. This certification is provided to the client for their own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.
3. The ductwork systems are approved based on:
 - I. Initial type testing
 - II. Audit testing at the frequency specified in TS48
 - III. A design appraisal against TS48
 - IV. Certification of quality management system.
 - V. Inspection and surveillance of factory production control
4. The ductwork systems comprise non-coated SUREFIRE steel ductwork. If insulation performance is required, the SUREFIRE ductwork is fitted with 96kg/m³ Calcium - Magnesium Silicate Insulation Blanket around the outside of the ductwork with thickness as indicated in this certificate.
5. This approval is applicable to insulated and uninsulated SUREFIRE steel ductwork systems as described within this Certificate.
6. The ductwork systems shall be mechanically supported from floor and/or wall constructions or structural steel members having a fire resistance of at least the same period as the ductwork systems.
7. The approval relates to ongoing production. Product and/or its immediate packaging is identified with the manufacturers' name, the product name or number, the CERTIFIRE name or name and mark, together with the CERTIFIRE certificate number and application where appropriate.
8. SUREFIRE ductwork is a non-coated system that does not require any coating treatment to achieve the fire resistance rating as certified within this certificate.

SUREFIRE Non-Coated Steel Ductwork Systems

CONSTRUCTION DETAILS

Details of the constructions of the different types of duct are given in the following sections. The construction details are arranged on the following order:

SUREFIRE FIRE RATED DUCT SYSTEM - LIST OF PRODUCTS		
Installation Table	Model	Product
A1	SFE120	SUREFIRE Fire Rated Rectangular Lockformed Duct System - Galvanised Steel Construction - 120min
A2	SFE240	SUREFIRE Fire Rated Rectangular Lockformed Duct System - Galvanised Steel Construction - 240min
A3	SFE/MS240	SUREFIRE Fire Rated Rectangular Welded Duct System - Black & Mild Steel Construction - 240min
A4	SFE/SS240	SUREFIRE Fire Rated Lockformed Duct System - Stainless Steel Construction - 240min
A5	SFE/SSW240	SUREFIRE Fire Rated Rectangular Welded Duct System - Stainless Steel Construction - 240min
A6	SFE/R120	SUREFIRE Fire Rated Circular & Oval Duct System - Galvanised Steel Construction - 120min
A7	SFE/R240	SUREFIRE Fire Rated Circular & Oval Duct System - Galvanised Steel Construction - 240min
A8	SFE/R/SS240	SUREFIRE Fire Rated Circular & Oval Duct System - Stainless Steel Construction - 240min
Fig 5	SFE(IF)120	SUREFIRE Fire Rated Access Duct Construction - Internal flange and stiffened duct
Fig 6	SFE/MP120	SUREFIRE Fire Rated Duct - Multipanel Duct
Fig 7	SF/ATT240	SUREFIRE Fire Rated - Sound Attenuator
Fig 8	SF/AD	SUREFIRE - Access Door

Appendix A - Tables of construction details. Appendix B - Figures of construction details

SUREFIRE Non-Coated Ductwork Systems

1. GALVANISED RECTANGULAR STEEL DUCTS (SFE120 & SFE240)

The steel duct is constructed in sections up to 1500mm long using hot dipped galvanized steel sheet, 0.6mm, 0.8mm, 1.0mm or 1.2mm thick. The sections are constructed with Pittsburgh lock or grooved corner (RAS) longitudinal seams and flanged cross-joints.

At each cross joint fire rated slip-on flanges are fastened to the duct with either 4.8mm diameter steel rivets at 150mm nominal centres or henrob at 150mm or spot welds at 100mm nominal centres. SUREFIRE slip-on flanges are fitted with steel corner plates of the respective flange size that slot into the flanges at each corner and are bolted together with an M10 steel nut and bolt at each corner. The cross joint flanges are fastened together with M8 bolted steel clamps at 300mm maximum centres. Where flanges are used the flanges are bolted together at each corner and clamps at 250mm maximum centres with minimum M8 steel nuts and bolts. Equivalent J2, J3, J4, J5 & J6 rated slip-on flanges are used for the respective rating. Each cross-joint is sealed with SureFire IG(GK) 15mm wide x 3mm thick fitted between the mating flanges. All duct joints are then sealed with fire rated intumescent sealant (SureFire FS702).

For ducts with stiffening collars the stiffening collar is fastened to all four sides of the duct using 4.8mm-diameter steel rivets at 150mm nominal centres or spot welded at 100mm intervals. For ducts with a longer side greater than 1000mm, the stiffeners, steel angle minimum 50mm x 40mm x 1.5mm thick are fastened to the duct through the 40mm leg, are bolted, riveted, welded, henrobed and/or with corner pieces. Alternative S3 rated stiffening collars are fitted in the same way. The size of the angle is increased to minimum 50mm x 50mm x 5mm thick for 120-minute ducts over 2500mm longer side and 240-minute ducts over 2000mm longer side. Alternative S5 rated stiffening collars may be fitted in the same way.

For duct sizes over 1000mm a steel tie rod type stiffener is fitted at one end of each duct section, at mid width, to the flanges of the cross joint. The minimum M10 threaded rod is bolted or welded to the cross joint. Two tie rods, equally spaced across the width of the duct, are fitted for duct widths greater than 2000mm.

All duct piercings, fastenings or locks are sealed with SureFire FS702 fire rated intumescent sealant.

The above construction details relate to commercial grade steel, which may include other forms of coated steel such as Aluzinc, Zinalume and Galvalume.

Details of the duct construction at a range of sizes, up to 3000mm wide x 2000mm high, are shown in Tables A1 & A2. These give details of the requirements for steel thickness, cross joints and intermediate stiffeners. Hanger/bearer details are given in Tables A9 & A10.

2. CIRCULAR AND FLAT OVAL DUCTS (SFE/R120 & SFE/R240)

Details of the construction of circular and flat oval straight seamed and spirally wound steel ducts are generally in accordance with those described in DW/144 - Specification for sheet metal duct work - low, medium and high pressure/velocity air systems (published by the Building & Engineering Services Association), or equivalent specification, but with the following minimum requirements:

- The thickness of steel sheet used in the construction of the ducts is shown in Tables A6 and A7. For stainless steel see Table A8.
- The longitudinal seams and cross joints must be at least equivalent in strength to the seams used on the tested rectangular duct.
- The spiral seam of spirally wound ducts must be equivalent to the grooved seam.
- The maximum diameter of circular ducts covered by this assessment is 2000mm.
- The design of the penetration seal where the duct passes through fire compartment walls or floors must be equivalent to the designs specified for rectangular ducts.
- The hanger bearer requirements are found in Tables A9 + A10.

The design of the hanger support systems should be such that the maximum stress in the hanger components does not exceed 15N/mm² for fire resistance periods up to 60 minutes, 10N/mm² for fire resistance periods up to 120 minutes and 6N/mm² for fire resistance periods up to 240 minutes.

Details of the duct construction at various sizes are given in Tables A6 to A8. These give details of the requirements for steel thickness, cross joints and intermediate stiffeners. All duct piercings, fastenings or locks are sealed with SureFire FS702 fire rated intumescent sealant.

The Calcium - Magnesium Silicate Insulation blanket is fitted to circular ducts in the same manner as for 4-sided rectangular ducts using steel pins or steel banding. The pins are fitted in a grid of 200mm along and around the duct.

Minimum steel thickness for flat oval ducts:

Type of duct	Maximum surface area per metre length - m ² /m			
	≤1.2	≤2.0	≤2.6	≤3.83
Ventilation Smoke outlet/extract	0.8	1.0	1.2	1.2
Kitchen extract	1.0	1.0	1.2	1.2

3. STAINLESS STEEL DUCTS (SFE/SSW240)

The stainless steel duct is constructed in sections up to 1500mm long using stainless steel sheet, 0.6mm, 0.8mm, 1.0mm or 1.2mm thick.

At each cross joint fire rated SUREFIRE slip-on flanges are fastened to the duct with either 4.8mm diameter steel rivets at 150mm nominal centres or henrob at 100mm, or spot welds at 100mm nominal centres. SUREFIRE slip-on flanges are fitted with steel corner plates of the respective flange size that slot into the flanges at each corner and are bolted together with an M10 steel nut and bolt at each corner. The cross joint flanges are fastened together with M8 bolted steel clamps at 300mm maximum centres. Where RSA flanges are used the flanges are bolted together at each corner and at 250mm maximum centres with minimum M8 steel nuts and bolts. Equivalent J2, J3, J4, JS & J6 rated slip-on flanges or RSA flanges are used for the respective rating. Each cross-joint is sealed with SureFire IG(GK) 15mm wide x 3mm thick fitted between the mating flanges. All other duct joints are sealed with SureFire FS702 fire rated intumescent sealant.

For ducts with stiffening collars the stiffening collar is fastened to all four sides of the duct using 4.8mm-diameter steel rivets at 150mm nominal centres, or henrob at 150mm, or spot welded at 100mm intervals. For ducts with a longer side greater than 1000mm, the stiffeners, steel angle minimum 50mm x 40mm x 1.2mm thick and fastened to the duct through the 40mm leg, are bolted, riveted or welded together at the corners. Alternative S3 rated stiffening collars are fitted in the same way. The size of the angle is increased to minimum 50mm x 50mm x 5mm thick for ducts over 2500mm longer side. Alternative S3 rated stiffening collars may be fitted in the same way.

For 120-minute ducts with a size over 1600mm a steel tie rod type stiffener is fitted at one end of each duct section, at mid width, to the flanges of the cross joint. The minimum M10 threaded rod is bolted or welded to the cross joint.

Two tie rods, equally spaced across the width of the duct, are fitted for duct widths greater than 2500mm.

For 240-minute ducts a single tie rod is fitted to ducts over 1000mm wide and two tie rods fitted to ducts over 2000mm wide.

Details of the duct constructions up to 3000mm wide x 2000mm high are shown in Tables A4 & A5. These give details of the requirements for steel thickness, cross joints and intermediate stiffeners. Hanger/bearer details are given in Table A10.

Permissible steel for construction is commercial grade stainless steel.

4. MILD STEEL WELDED DUCTS (SFE/MS240)

The steel duct is constructed in sections up to 1500mm long using cold rolled or hot rolled sheets a minimum of 1.4mm thick. Longitudinal joints are fully welded end-to-end. Where construction requires a heavy gauge system incorporating 1.50 mm or 2.0 mm thick steel, then the duct specifications are incorporated in HGDS120 and HGDS240.

At each cross joint rolled steel angles (RSA) are fully welded to each end of the duct. The minimum sizes of RSA for various duct sizes up to 3000mm are shown in Tables A3. The RSA flanges are bolted together at each corner and at 250mm maximum centres with minimum M8 nuts and bolts. Each cross-joint is sealed with SureFire IG(GK) 15mm wide x 3mm thick fitted between the mating flanges. Alternatively, cross-joints may be welded together to form a fully welded construction. All other duct joints are sealed with SureFire FS702 fire rated intumescent sealant.

RSA stiffening collars are fitted to the duct at 630mm maximum centres for 120-minute ducts with a longer side greater than 1200mm wide and for 240-minute ducts with a longer side greater than 1000mm wide. The stiffening collar is fitted to all four sides of the duct with MIG stitch welds at 200mm nominal centres and welded together at the corners. The minimum sizes of stiffening collar for various duct sizes up to 3000mm are shown in Tables A3.

For 120-minute ducts with a size over 1600mm a steel tie rod type stiffener is fitted at one end of each duct section, at mid width, to the flanges of the cross joint. The minimum M10 threaded rod is bolted or welded to the cross joint. Two tie rods, equally spaced across the width of the duct, are fitted for duct widths greater than 2000mm. For 240-minute ducts a single tie rod is fitted to ducts over 1200mm wide and two tie rods fitted to ducts over 1600mm wide.

Details of the duct construction at a range of sizes, up to 3000mm wide x 2000mm high, are shown in Table A3. These give details of the requirements for steel thickness, cross joints and intermediate stiffeners.

All duct piercings, fastenings or locks are sealed with SureFire FS702 fire rated intumescent sealant.

Details of the duct constructions up to 3000mm wide x 2000mm high are shown in Table A5. These give details of the requirements for steel thickness, cross joints and intermediate stiffeners. Hanger/bearer details are given in Table A10.

For flat oval ducts over 500mm wide x 150mm deep, tie rods, with a minimum diameter of 12mm, must be fitted between the top and bottom walls of the flat portion of the duct, as follows:

- for ducts between 500mm wide and 700mm wide, there should be one tie rod located at mid width of the duct at 1000mm centres along the duct.
- for ducts between 701mm wide and 900mm wide, there should be one tie rod located at mid width of the duct at 750mm centres along the duct.
- for ducts between 901mm wide and 1200mm wide, there should be two tie rods equispaced across the duct at 500mm centres along the duct.
- for ducts between 1201mm wide and 1800mm wide, there should be tie rods at 250mm centres along the duct, alternating between one tie rod centrally located and two tie rods equispaced across the duct.

All duct piercings, fastenings or locks are sealed with SureFire FS702 fire rated intumescent sealant.

All hanger/bearer details are the same as for the rectangular ducts.

5. MULTI-PANEL DUCTS (SFE/MP 120)

The steel duct is constructed in sections up to 1500mm long using hot dipped galvanised steel sheet, mild steel sheet or stainless steel sheet 1.2mm thick. The duct comprises corner panels, maximum 1000mm x 1000mm, and flat panels, maximum 2000mm wide. 'U-panels' may be constructed a maximum width of 1500mm and a maximum height of 1000mm. Each panel is reinforced around the perimeter and at mid-depth with steel angle, 50mm x 50mm x 5.0mm thick. The angles are fastened to the sheet with M6 steel bolts or 4.8mm steel rivets at maximum 150mm centres or spot welds at 75mm maximum centres. The panels are fastened together with M10 steel setscrews and nuts at 250mm maximum centres. Each section is fitted with tie bars/drop rods at 1000mm maximum centres with the two end rods/bars positioned nominally 250mm from ends of the section. The bars are connected to the angle at mid-depth with a nut and washer on both sides. The bars/rods are extended to the supporting structure above the duct to form the hangers. The spacing of the hangers and the size of the steel hanger components must be adjusted so that the tensile stress in the bars/rods does not exceed 15N/mm² for fire resistance periods up to 60 minutes, 10N/mm² for fire resistance periods up to 120 minutes and 6N/mm² for fire resistance periods up to 240 minutes.

The maximum spacing of the hangers is 1500mm. The duct sections are fastened together with M10 steel set screws and nuts at 250mm centres. Each cross-joint is sealed with SureFire IG(GK) 15mm wide x 3mm thick fitted between the mating flanges.

All other duct joints are sealed with SureFire FS702 fire rated intumescent sealant. The maximum size of the steel ducts is 8000mm wide x 6000mm high.

6. INTERNALLY FLANGED AND STIFFENED DUCTS (SFE(IF)120)

Where it is not possible for the duct flanges and stiffeners to be fitted to the outside the duct, flanges to meet cross joint ratings and stiffeners to meet stiffener ratings can be fitted internally. The flanges are fastened to the duct in the same way as for external profiles. The flanges are welded, bolted, riveted or henrobed at corners in the same way as they are fastened when fitted externally. Construction details are shown in Figure 5. Construction range see table A1. Hanger + Bearer see A9.

7. SOUND ATTENUATOR (SF/ATT240)

The construction of the duct casing of the Coustek sound attenuators must comply with the specification for the SUREFIRE ductwork as a minimum. This includes the steel thickness, longitudinal joints, cross joints and fixings. Steel pods are fitted within the attenuator casing. Each pod is constructed with bullnose or pointed sections at each end, minimum 0.8mm thick, and perforated sides, minimum 0.7mm thick. The pods are filled with mineral wool with a minimum density of 48kg/m³. The pods are fastened to the body of the attenuator with 4.8mm steel rivets at 150mm nominal centres, henrobe at 150mm or spot welds at 100mm centres. The sound attenuator units may be insulated with the same insulation system as used for the ventilation duct system. Details of construction are shown in Figure 7. The attenuators may be constructed with removable baffles held in place with welded, bolted riveted or henrobed to the casing at 200mm centres.

The sound attenuator units must each be supported by at least two steel hangers in the same manner as the steel duct system. The spacing of the hangers and the size of the steel hanger components must be adjusted so that the tensile stress in the rods and the bending stress in the channel bearers do not exceed 15N/mm² for fire resistance periods up to 60 minutes, 10N/mm² for fire resistance periods up to 120 minutes and 6N/mm² for fire resistance periods up to 240 minutes.

8. ACCESS DOOR (SF/AD) STANDARD RANGE

The maximum opening size of the of the 450mm x 450mm. Access doors must be fitted to top or sides of the duct, as follows:

- Fit to duct giving consideration for clearance and ease of use.
- The size of ope is calculated as door size -30mm, e.g. 400x400 door, ope size cut 370x370.
- Mark the ductwork and cut access.
- Fit the tabbed frame, hammering tabs securely to the ductwork, on top or sides, subject to access.
- For kitchen extract ductwork to be compliant to the specification DW172 that access doors are installed a 2-metre centres.

SUREFIRE Fire Rated Access Doors EnSave Range

SureFire fire rated access are a long standing market winner in Ireland & the UK and have been in circulation since its first testing in 2005. Our doors are quite distinct in their robust build and heavily favoured by contractors for their site durability. Our EN-SAVE upgraded model has been marketed to meet standard duct requirements for many years and uniquely offers a class D low leakage certification which is now available in a fully fire rated system. En-Save offers the following advantages:

A. RATING

En-Save is tested and rated to the following:
BS 276 part 24 - 4hr (in kitchen and smoke extract)
Tested to EN 12101-7 and CE marked for EI 90
Tested to EN 15871 for fire and rated for EI 90

B. ENERGY

High Pressure - 2000 Pa (Positive) / 750 Pa (Negative)
Low leakage - Class D BSIRA tested and certified.
Low U value rated at 0.04W/(m.k).
Achieving the desired design in a specific compartment of a fire or smoke extract system is greatly influenced by the overall leakage in the ductwork system and often requiring higher energy to successfully comply. The greatest leakage is often found in the access doors, En-Save neutralises this concern.

C. SAFETY

All En-Save doors come with cut out template and easy fix tabs which ensure there is no raw edge exposed at a future point of use.

D. BUILT QUALITY

Our standard En-Save door is resilient being manufactured with combined 2.0mm galvanised sheet metal resistance with a Z275 zinc coating. The cam locks are attached using a closed head punched rivet and not industry standard aluminium blind rivet that are prone to shear and fail. Our doors come with an industrial handle unlike the 3mm wire. Which provides the greatest leverage force. They also come with a retaining wire as standard which ensures no loss of door panel.

E. HYGIENE

Hygiene has become more of concern on sites with the goal of minimizing cross contamination and eliminate Covid spread. En-Save doors come prepacked in cartons to minimize unnecessary handling and site defacement.

F. BEST VALUE

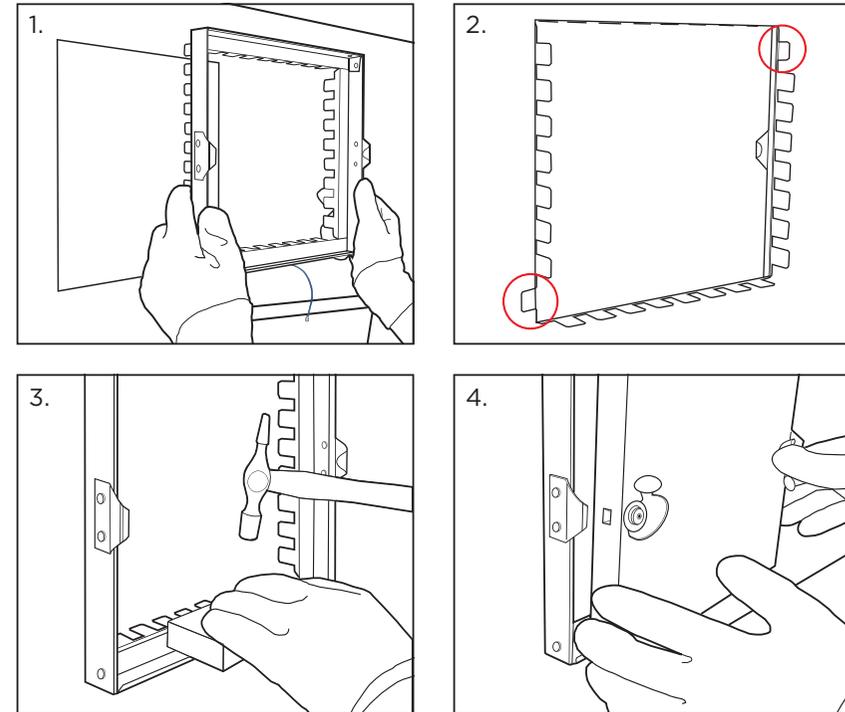
The En-Save door is faster to install because each door comes complete with a template cut out and requires no training to install. Simply install in four easy steps (see catalogue). This saves installers time and money. Site error is quite common where template stickers do not come individually.

G. AVAILABLE STOCK SIZES ARE AS FOLLOWS:

200x200
250x250
300x300
350x350
400x400
450x450

Also available in 76mm depth SureFire fire rated access doors are suitable for all ductwork systems tested to BS or EN standards. They are insulated as standard with a calcium -magnesium silicate blanket.

SureFire access doors are the only guaranteed 10 year door on the market.



General Specifications (For all types)

HORIZONTAL DUCTS

Details of horizontal duct installations are shown in Figure 1 in Appendix B. In the following sections the construction details for different types of duct are described.

VERTICAL DUCTS

Vertical duct installation is shown in Figure 2.

The construction of vertical ducts is the same as for horizontal ducts. In order to support the duct system in the vertical orientation, steel sections are fastened to the steel duct, either along the two longer sides or on all four sides. The steel sections either span across the opening in the concrete floor or form part of a cantilever bracket that is fastened to the building structure. The maximum vertical distance between supports is 4.0m. Also, to prevent buckling of the duct, the distance between supports should not exceed 8 times the smallest lateral dimension across the outside face of the steel duct. The weight of the duct system is taken by the building structure at each floor levels. The stress limit within the steel supports is 10N/mm^2 for fire exposures of up to 120 minutes and 6N/mm^2 for fire resistance periods up to 240 minutes. On insulated ducts, the supporting steel members, where they emerge from the protection around the duct, are clad with the same thickness of insulation for at least 300mm.

The design of the penetration seal for vertical ducts through concrete floors and the application of the Calcium - Magnesium Silicate Insulation blanket are the same as for horizontal ducts.

HANGER SUPPORTS

Details of the hanger supports for different sizes for fire exposure up to 240 minutes are given in the Tables A9, A10, A11 & A12 for each type of duct construction. Each steel hanger consists of two threaded drop rods, minimum M8, and a channel section bearer. The bearer is fastened to the drop rods with hexagonal nuts and washers. The spacing of the hangers and the size of the steel hanger components must be adjusted so that the tensile stress in the rods and the bending stress in the angles/channels do not exceed 15N/mm^2 for fire resistance periods up to 60 minutes, 10N/mm^2 for fire resistance periods up to 120 minutes and 6N/mm^2 for fire resistance periods up to 240 minutes. The maximum spacing of the hangers is 1500mm. Each hanger must be positioned so that it is adjacent to (within 100mm of) a cross joint or a stiffening collar. The bearers may be fitted within or outside the insulation. Larger bearers are fitted outside the insulation. The drop rods are positioned outside the insulation material but at not more than 50mm from the insulation.

Where the construction of the concrete floor or the structural steelwork above the duct, from which the duct is supported, does not allow the drop rods to be located close to the duct walls, an increase in the distance between the drop rods and the duct walls would not be expected to adversely affect the fire resistance performance of the duct assemblies provided that the sizes of the hanger members are adjusted to comply with the stress limitations stated above.

The fixings used to fasten the threaded rod hangers to concrete soffits must be all-steel expanding anchors with a penetration into the concrete of at least 40mm for 120 minutes fire resistance. The anchors must match the size of the threaded rods, be of sufficient strength to support the weight of the duct and be fitted in accordance with the manufacturer’s instructions. Suitable fixings are such as Hilti HKD anchors or equivalent. For hollow core concrete it is recommended that all steel anchors designed for hollow core concrete be used.

When fixing to a steel supporting construction, a hole should be drilled through the steel member, allowing the drop rod to be supported by a steel nut and washer above. If a clamp type fixing is used the clamp must be composed of steel, suitable for the purpose and pass around the steel member and be fastened back on itself. Clamps that rely on friction to hold them in place are not suitable.

A supporting concrete construction must consist of steel reinforced structural concrete and be capable of supporting the anticipated loads for the required period of fire resistance. It is not possible to specify a minimum grade of concrete due to the wide range of different types of concrete (e.g. dense aggregate, lightweight aggregate, autoclaved aerated). However, in all cases the type of fixing should be designed

for the type of concrete and the depth of the fixing may have to be increased to maintain adequate engagement.

INSULATION

The insulation material fitted around the ducts is Calcium - Magnesium Silicate Insulation blanket. The blanket has a nominal density of 96kg/m³. The blanket, supplied in rolls 610mm or 1220mm wide, is provided in thicknesses of 13, 25, 38 and 50mm. The thicknesses of insulation required for the ducts are shown in Table 1.

TABLE 1 INSULATION THICKNESS

Fire resistance - minutes	Protection thickness - mm	
	Duct A	Duct B
60	38	76*
120	76	76**

* 76 mm of Calcium - Magnesium Silicate Insulation blanket with a density of 96kg/m³ (2 layers of 38mm).

** Gives 120 minutes in vertical orientation only.

Note:

60 minute combustible linings with 76mm of insulation (96kg/m³).

INSULATION (Continued)

The steel duct is clad with one or two layers of 96kg/m³ Calcium - Magnesium Silicate Insulation Blanket that are wrapped around the duct. For two-layer systems all joints are tight butt joints. Joints are staggered between layers by 300mm. For single layer protection all joints are overlapped by nominally 75mm. The 96kg/m³ Calcium - Magnesium Silicate Insulation blanket is fastened to the duct with either 2.7mm diameter steel pins with 30mm galvanised washer heads or strapped with steel banding at 500mm max. centres. The pins are welded, screwed, or riveted to the steel duct at 200mm centres across the width of the duct and 200mm centres along the length of the duct. The arrangement is shown in Figures 3 & 4.

SMOKE OUTLET DUCTS

If the duct is to act as a smoke outlet duct, then additional steel tie rod type stiffeners are fitted adjacent to any bare openings in the side wall of horizontal ducts. Two M10 threaded rods, fitted with steel nuts and washers, are positioned 50mm behind the aperture spaced 1/3 and 2/3 across the opening. These are not required for duct systems with fire ratings up to 180 minutes but only for systems with a fire rating of 240 minutes.

KITCHEN EXTRACT DUCTS

For kitchen extraction ductwork the construction is the same as described above to achieve the required integrity and stability ratings for a maximum of up to 240 minutes. The insulation thickness required is a double wrap of 38mm Calcium - Magnesium Silicate Blanket to maintain the internal temperature (combustible lining) below 180° max (or 140° mean average) to achieve a circa 60 minute rating (v_e 61mins h_e 56mins @ 96kg/m³ x2 layers of 38mm or 1hr @ 128kg/m³ x2 layers).

PENETRATION SEAL

The penetration seal system, where the duct passes through fire compartment walls or floors, is the same as that tested in report WF No. 332925A for uninsulated ducts and the same as that tested in report WF No. 332925C for insulated ducts. Rockwool coated mineral fibre slab, minimum 100mm thick x 160kg/m³ density, or Firetherm coated Fire Stop Board, minimum 100mm thick x 140kg/m³ density (2 x 50mm Fire Batt), is fitted around the duct within the opening. The aperture can be less than or equal to 150mm greater than the duct size. All edges between the slab, the wall or floor and the steel duct are sealed with SureFire FS702 intumescent mastic on both faces of the penetration seal.

A steel plate collar, minimum 1.0mm thick, is fitted around the steel duct on both sides of the wall, overlapping the wall or floor by at least 100mm on each side. The plate is fixed to the wall or floor with M10 all-steel expanding anchors at 300mm maximum centres or with plasterboard screws into flexible wall construction. All edges between the plate collar, the wall or floor and the steel duct are sealed with SureFire FS702. A duct cross joint or a steel stiffening collar must be positioned within the thickness of the seal assembly as shown in figure 9 + 10.

Appendix A - Tables A1-A8 Manufacturing details / A9-A12 Hanger + Bearer specifications

Table A1	SFE120 SFE(IF/120)	SUREFIRE Fire Rated Rectangular Lockformed Duct System - Galvanised Steel Construction - 120 minutes
Table A2	SFE240	SUREFIRE Fire Rated Rectangular Lockformed Duct System -Galvanised Steel Construction - 240 minutes
Table A3	SFE/MS240	SUREFIRE Fire Rated Rectangular Welded Duct System - Black & Mild Steel Construction - 240 minutes
Table A4	SFE/SS240	SUREFIRE Fire Rated Rectangular Lockformed Duct System – Stainless Steel Construction - 240 minutes
Table A5	SFE/SSW240	SUREFIRE Fire Rated Rectangular Welded Duct System – Stainless Steel Construction – 240 minutes
Table A6	SFE/R120	SUREFIRE Fire Rated Circular & Oval Duct System – Galvanised Steel Construction – 120 minutes
Table A7	SFE/R240	SUREFIRE Fire Rated Circular & Oval Duct System – Galvanised Steel Construction – 240 minutes
Table A8	SFE/R/SS240	SUREFIRE Fire Rated Circular & Oval Duct System – Stainless Steel Construction – 240 minutes
Table A9	SFE/120 SFE/R120 SFE(IF)120	SUREFIRE Hanger and Bearer Specification - Galvanised Duct Construction Standard - 120 minutes
Table A10	SFE/240 SFE/R240 SFE/MS240 SFE/SSW240	SUREFIRE Hanger and Bearer Specification - Galvanised Duct Construction Standard - 240 minutes
Table A11	SFE/MS240	SUREFIRE Hanger and Bearer Specification – Mild/Black Steel Duct Construction Standard – 240 minutes
Table A12	SFE/SS240 SFE/SSW240	SUREFIRE Hanger and Bearer Specification – Stainless Steel Construction – 240 minutes

Table A1 - Galvanised rectangular steel ductwork specification - 120 minutes - SFE120 (Standard manufacturing)

SFE120: SUREFIRE RATED RECTANGULAR LOCKFORMED DUCT SYSTEM - GALVANISED STEEL CONSTRUCTION - 120MIN FIRE RESISTANCE: STABILITY & INTEGRITY										
DUCT SIZE	STANDARD DUCT	SHEET GAUGE	CROSS JOINT/ CONNECTOR				STIFFENER			
	LENGTH	THICKNESS	TYPE/ RATING	FASTENING	TIEBAR	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING	CORNERS
0 - 400	1500 mm	24ga 0.60 mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
401 - 600	1500 mm	22ga 0.80 mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
601 - 800	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J3	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
801 - 1000	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J4	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
1001 - 1600	1500 mm	20ga 1.0 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
1601 - 2000	1500 mm	20ga 1.0 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
2001 - 2500	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
2501 - 3000	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x50x5mm Angle - S5	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	Bolted with M8 bolts and nuts or welded

Table A2 - Galvanised rectangular steel ductwork specification - 240 minutes - SFE240 (On request)

SFE240: SUREFIRE RATED RECTANGULAR LOCKFORMED DUCT SYSTEM - GALVANISED STEEL CONSTRUCTION - 120MIN FIRE RESISTANCE: STABILITY & INTEGRITY										
DUCT SIZE	STANDARD DUCT	SHEET GAUGE	CROSS JOINT/ CONNECTOR				STIFFENER			
	LENGTH	THICKNESS	TYPE/ RATING	FASTENING	TIEBAR	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING	CORNERS
0 - 400	1500 mm	22ga 0.80 mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
401 - 600	1500 mm	22ga 0.80 mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
601 - 800	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J3	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
801 - 1000	1500 mm	20ga 1.0 mm	30mm SUREFIRE Slip-on flange - J4	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
1001 - 1600	1500 mm	20ga 1.0 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
1601 - 2000	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
2001 - 2500	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.5mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	4.8 Rivet or welded
2501 - 3000	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x50x1.5mm angle - S5	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or henrobed @150mm	Bolted with M8 bolts and nuts or welded

Table A3 - Mild/black rectangular steel welded ductwork specification - 240 minutes - SFE/MS240

RMSW120: SUREFIRE FIRE RATED RECTANGULAR WELDED DUCT SYSTEM - BLACK & MILD STEEL CONSTRUCTION - 240 MIN										
DUCT SIZE	STANDARD DUCT	SHEET GAUGE	CROSS JOINT/ CONNECTOR				STIFFENER			
	LENGTH	THICKNESS	TYPE/ RATING	FASTENING	TIEBAR	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING	CORNERS
0 - 400	1500 mm	16ga 1.40 mm	25x25x2.5mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
401 - 600	1500 mm	16ga 1.40 mm	25x25x2.5mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
601 -1000	1500 mm	16ga 1.40 mm	30x30x3mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
1001 - 1600	1500 mm	16ga 1.40 mm	30x30x3mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	30x30x3mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stitch Weld or Mig Tack Welded at 200mm centres	Welded at corners
1201-1600	1500 mm	16ga 1.40 mm	40x40x4mm Rolled Steel Angle	Continuously Welded on Duct	1 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	40x40x4mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stitch Weld or Mig Tack Welded at 200mm centres	Welded at corners
1601 - 2000	1500 mm	16ga 1.40 mm	40x40x4mm Rolled Steel Angle	Continuously Welded on Duct	1 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	40x40x4mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stitch Weld or Mig Tack Welded at 200mm centres	Welded at corners
2001 - 2500	1500 mm	16ga 1.40 mm	50x50x5mm Rolled Steel Angle	Continuously Welded on Duct	2 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	50x50x5mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stitch Weld or Mig Tack Welded at 200mm centres	Welded at corners
2501 - 3000	1500 mm	16ga 1.40 mm	50x50x5mm Rolled Steel Angle	Continuously Welded on Duct	2 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	50x50x5mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stitch Weld or Mig Tack Welded at 200mm centres	Welded at corners

Coating of duct externally with Red Oxide Primer & Glavanic base paint (Optional)

Ducts may be welded together at cross joints. Where nuts and bolts are utilized, intumescent fire gasket is applied between mating flanges.

Table A4 - Stainless rectangular steel ductwork specification - 240 minutes - SFE/SS240

SFE/SS240: SUREFIRE RATED RECTANGULAR LOCKFORMED DUCT SYSTEM - STAINLESS STEEL CONSTRUCTION - 240MIN										
DUCT SIZE	STANDARD DUCT	SHEET GAUGE	CROSS JOINT/ CONNECTOR				STIFFENER			
	LENGTH	THICKNESS	TYPE/ RATING	FASTENING	TIEBAR	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING	CORNERS
0 - 400	1500 mm	22ga 0.80 mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
401 - 600	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J3	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
601 - 800	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J3	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
801 - 1000	1500 mm	22ga 0.80 mm	30mm SUREFIRE Slip-on flange - J4	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	-	M8 clamp at 300mm	-	-	-	-
1001 - 1600	1500 mm	20ga 1.00 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.2mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	4.8 Rivet or welded
1601 - 2000	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J5	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	1 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.2mm angle w/ safe edge - S3	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	4.8 Rivet or welded
2001 - 2500	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x40x1.2mm angle w/ safe edge - S5	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	4.8 Rivet or welded
2501 - 3000	1500 mm	18ga 1.2 mm	40mm SUREFIRE Slip-on flange - J6	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	2 x M10 at max 50mm from Cross Joint	M8 clamp at 300mm	50x50x5mm RSA - S5	Max 750mm to joint or stiffener	4.8mm Rivet @150mm or spot welded @100mm or Henrobed @150mm	Bolted with M8 bolts and nuts or welded

Table A5 - Stainless rectangular steel welded ductwork specification - 240 minutes - SFE/SSW240

SFE/SSW240: SUREFIRE FIRE RATED RECTANGULAR WELDED DUCT SYSTEM - STAINLESS STEEL CONSTRUCTION - 240 MIN										
DUCT SIZE	STANDARD DUCT	SHEET GAUGE	CROSS JOINT/CONNECTOR				STIFFENER			
	LENGTH	THICKNESS	TYPE/RATING	FASTENING	TIEBAR	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING	CORNERS
0 - 400	1500 mm	20ga 1.00 mm	25x25x2.5mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
401 - 600	1500 mm	20ga 1.00 mm	25x25x2.5mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
601 - 1000	1500 mm	20ga 1.00 mm	30x30x3mm Rolled Steel Angle	Continuously Welded on Duct	-	M8 nuts with bolts at 300mm	-	-	-	-
1001 - 1200	1500 mm	18ga 1.20 mm	30x30x3mm Rolled Steel Angle	Continuously Welded on Duct	1 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	-	-	-	-
1201 - 1600	1500 mm	18ga 1.2 mm	30x30x3mm Rolled Steel Angle	Continuously Welded on Duct	1 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	30x30x3mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stich Weld or Mig Tack Welded at 200mm centres	Welded at Corners
1601 - 2000	1500 mm	18ga 1.2 mm	40x40x4mm Rolled Steel Angle	Continuously Welded on Duct	1 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	40x40x4mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stich Weld or Mig Tack Welded at 200mm centres	Welded at Corners
2001 - 3000	1500 mm	18ga 1.2 mm	50x50x5mm Rolled Steel Angle	Continuously Welded on Duct	2 x M10 at max 50mm from Cross Joint	M8 nuts with bolts at 300mm	50x50x5mm Rolled Steel Angle	Max 630mm to joint or stiffener	Stich Weld or Mig Tack Welded at 200mm centres	Welded at Corners

All accessories including rivets, threaded bars, bolts and nuts used for duct fabrication shall be Stainless Steel.

Ducts may be welded together at cross joints. Where nuts and bolts are utilized, intumescent fire rated gasket is applied between mating flanges.

Table A6 - Galvanised steel circular and flat oval ductwork specification - 120 minutes - SFE/R120 (Standard manufacturing)

SFE/R120: SUREFIRE FIRE RATED CIRCULAR & OVAL DUCT SYSTEM - GALVANISED STEEL CONSTRUCTION - 120MIN									
DUCT SIZE	STANDARD DUCT		SHEET GAUGE THICKNESS	CROSS JOINT/ CONNECTOR			STIFFENER		
	LENGTH	THICKNESS		TYPE/ RATING	FASTENING	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING
0 - 400	Straight Seamed	1200 mm	0.80 mm	Spigot Coupling	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	4.8mm Rivet @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.60 mm						
401 - 600	Straight Seamed	1200 mm	0.80 mm	25 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	4.8mm Rivet @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.60 mm						
601 - 800	Straight Seamed	1200 mm	0.80 mm	25 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
801 - 1000	Straight Seamed	1220 mm	1.00 mm	30 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
1001 - 1500	Straight Seamed	1220 mm	1.20 mm	30 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	30mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.00 mm						
1501 - 2000	Straight Seamed	1220 mm	1.20 mm	50 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	50mm Deep 5m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.20 mm						

Table A7 - Galvanised steel circular and flat oval ductwork specification - 240 minutes - SFE/R240 (On request)

SFE/R240: SUREFIRE FIRE RATED CIRCULAR & OVAL DUCT SYSTEM - GALVANISED STEEL CONSTRUCTION - 240MIN									
DUCT SIZE	STANDARD DUCT		SHEET GAUGE THICKNESS	CROSS JOINT/ CONNECTOR			STIFFENER		
	LENGTH	THICKNESS		TYPE/ RATING	FASTENING	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING
0 - 400	Straight Seamed	1220 mm	0.80 mm	Spigot Coupling	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	-	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
401 - 600	Straight Seamed	1220 mm	0.80 mm	25 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	4.8mm Rivet @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
601 - 800	Straight Seamed	1220 mm	0.80 mm	25 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
801 - 1000	Straight Seamed	1220 mm	1.00 mm	30 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	30mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	3000 mm	1.00 mm						
1001 - 1500	Straight Seamed	1220 mm	1.20 mm	40 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	40mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.20 mm						
1501 - 2000	Straight Seamed	1220 mm	1.20 mm	50 mm deep flange or SMJ	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	50mm Deep 5m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.20 mm						

Table A8 - Stainless steel circular and flat oval ductwork specifications - 240 minutes - SFE/R/SS240

SFE/R/SS120: SUREFIRE FIRE RATED CIRCULAR & OVAL DUCT SYSTEM - STAINLESS STEEL CONSTRUCTION - 240MIN									
DUCT SIZE	STANDARD DUCT		SHEET GAUGE THICKNESS	CROSS JOINT/ CONNECTOR			STIFFENER		
	LENGTH	THICKNESS		TYPE/RATING	FASTENING	REINFORCEMENT	TYPE/RATING	SPACING	FASTENING
0 - 400	Straight Seamed	1200 mm	0.80 mm	Spigot Coupling	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	4.8mm Rivet @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.60 mm						
401 - 600	Straight Seamed	1200 mm	0.80 mm	25 mm deep flange	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	4.8mm Rivet @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.60 mm						
601 - 800	Straight Seamed	1200 mm	0.80 mm	25 mm deep flange	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	-	-	-
	Spiral Wound Seam	3000 mm	0.80 mm						
801 - 1000	Straight Seamed	1220 mm	1.00 mm	30 mm deep flange	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	30mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	3000 mm	0.80 mm						
1001 - 1500	Straight Seamed	1220 mm	1.20 mm	40 mm deep flange	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	40mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.00 mm						
1501 - 2000	Straight Seamed	1220 mm	1.20 mm	50 mm deep flange	4.8mm Rivet @150mm or henrobed @150mm or welded @100mm	M8 Fastening bolt @300mm	50mm Deep 3m Rolled Angle or 2X M10 Tie Rod cross	Max 750mm to joint or stiffener	Welded, bolted or 4.8mm Rivet at 200mm
	Spiral Wound Seam	1500 mm	1.20 mm						

Table A9 Hanger and Bearer Specifications - Galvanised steel - 120 minutes - SFE/120 & SFE/R120 (Standard offered)

HANGERS AND BEARER SPECIFICATION - GALVANISED DUCT CONSTRUCTION - 120 MIN						
DUCT SIZE	DUCT LENGTH		HANGERS AND BEARERS			
	RECTANGULAR	ROUND/OVAL	STIFFENER SPACING (RECTANGULAR)	HANGER SPACING (ALL)	ROD SIZE (ALL)	BEARER CHANNEL (ALL)
0 - 400	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
401 - 600	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
601 - 800	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
801 - 1000	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
1001 - 1600	1500 mm	3000 mm	750 mm	1500 mm	M10	80x40x2.5
1601 - 2000	1500 mm	3000 mm	750 mm	1500 mm	M12	80x40x2.5
2001 - 2500	1500 mm	3000 mm	500 mm	1500 mm	M16	102mm x 51mm RSC fitted on edge
2501 - 3000	1500 mm	3000 mm	500 mm	1500 mm	M18	102mm x 51mm RSC fitted on edge

Table A10 Hanger and Bearer Specifications - Galvanised steel - 240 minutes - SFE/240 & SFE/R240 (On request)

HANGERS AND BEARER SPECIFICATION - STAINLESS STEEL DUCT CONSTRUCTION STANDARD - 240 MIN						
DUCT SIZE	DUCT LENGTH		HANGERS AND BEARERS			
	RECTANGULAR	ROUND/OVAL	STIFFENER SPACING (RECTANGULAR)	HANGER SPACING (ALL)	ROD SIZE (ALL)	BEARER CHANNEL (ALL)
0 - 400	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
401 - 600	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
601 - 800	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
801 - 1000	1500 mm	3000 mm	750 mm	1500 mm	M12	40x40x2.5
1001 - 1600	1500 mm	3000 mm	750 mm	1500 mm	M14	80x40x2.5
1601 - 2000	1500 mm	3000 mm	750 mm	1500 mm	M18	80x40x2.5
2001 - 2500	1500 mm	3000 mm	500 mm	1500 mm	M20	102mm x 51mm RSC fitted on edge
2501 - 3000	1500 mm	3000 mm	500 mm	1500 mm	M22	102mm x 51mm RSC fitted on edge

Table A11 Hanger and Bearer Specifications - Mild/black steel - 240 minutes - SFE/MS240

HANGERS AND BEARER SPECIFICATION - MILD/BLACK STEEL DUCT CONSTRUCTION STANDARD - 240 MIN						
DUCT SIZE	DUCT LENGTH		HANGERS AND BEARERS			
	RECTANGULAR	ROUND/OVAL	STIFFENER SPACING (RECTANGULAR)	HANGER SPACING (ALL)	ROD SIZE (ALL)	BEARER CHANNEL (ALL)
0 - 400	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
401 - 600	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
601 - 800	1500 mm	3000 mm	750 mm	1500 mm	M12	40x40x2.5
801 - 1000	1500 mm	3000 mm	750 mm	1500 mm	M14	40x40x2.5
1001 - 1600	1500 mm	3000 mm	750 mm	1500 mm	M18	80x40x2.5
1601 - 2000	1500 mm	3000 mm	750 mm	1500 mm	M20	80x40x2.5
2001 - 2500	1500 mm	3000 mm	500 mm	1500 mm	M24	102mm x 51mm RSC fitted on edge
2501 - 3000	1500 mm	3000 mm	500 mm	1500 mm	M26	102mm x 51mm RSC fitted on edge

Table A12 Hanger and Bearer Specification - Stainless steel - 240 minutes - SFE/MS240

HANGERS AND BEARER SPECIFICATION - STAINLESS STEEL DUCT CONSTRUCTION STANDARD - 240 MIN						
DUCT SIZE	DUCT LENGTH		HANGERS AND BEARERS			
	RECTANGULAR	ROUND/OVAL	STIFFENER SPACING (RECTANGULAR)	HANGER SPACING (ALL)	ROD SIZE (ALL)	BEARER CHANNEL (ALL)
0 - 400	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
401 - 600	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
601 - 800	1500 mm	3000 mm	750 mm	1500 mm	M10	40x40x2.5
801 - 1000	1500 mm	3000 mm	750 mm	1500 mm	M12	40x40x2.5
1001 - 1600	1500 mm	3000 mm	750 mm	1500 mm	M14	80x40x2.5
1601 - 2000	1500 mm	3000 mm	750 mm	1500 mm	M18	80x40x2.5
2001 - 2500	1500 mm	3000 mm	500 mm	1500 mm	M20	102mm x 51mm RSC fitted on edge
2501 - 3000	1500 mm	3000 mm	500 mm	1500 mm	M22	102mm x 51mm RSC fitted on edge

Appendix B - Figures 1 to 12 - Details of duct construction

Figure 1	All models	SUREFIRE Fire Rated Duct Installation Details - Horizontal Duct Installation
Figure 2	All models	SUREFIRE Fire Rated Duct Installation Details - Vertical Duct Installation
Figure 3	All models	SUREFIRE Fire Rated Duct Installation Details - Single layer insulated duct Installation
Figure 4	All models	SUREFIRE Fire Rated Duct Installation Details - Multi layer insulated duct Installation
Figure 5	SFEIF (option)	SUREFIRE Fire Rated Duct Construction - Internal Flanges and Stiffener Fastening
Figure 6	SFEMP (option)	SUREFIRE Fire Rated Duct Construction - Multipanel Duct Construction Details
Figure 7	SF/ ATT240 (option)	SUREFIRE Fire Rated - Sound attenuator
Figure 8	SF/AD	SUREFIRE Fire Rated - Access door
Figure 9	All models	Uninsulated penetration seal for square duct
Figure 10	All models	Insulated penetration seal for square duct
Figure 11	All models	Uninsulated penetration seal for round duct
Figure 12	All models	Insulated penetration seal for round duct

Figure 1 Horizontal duct installation duct

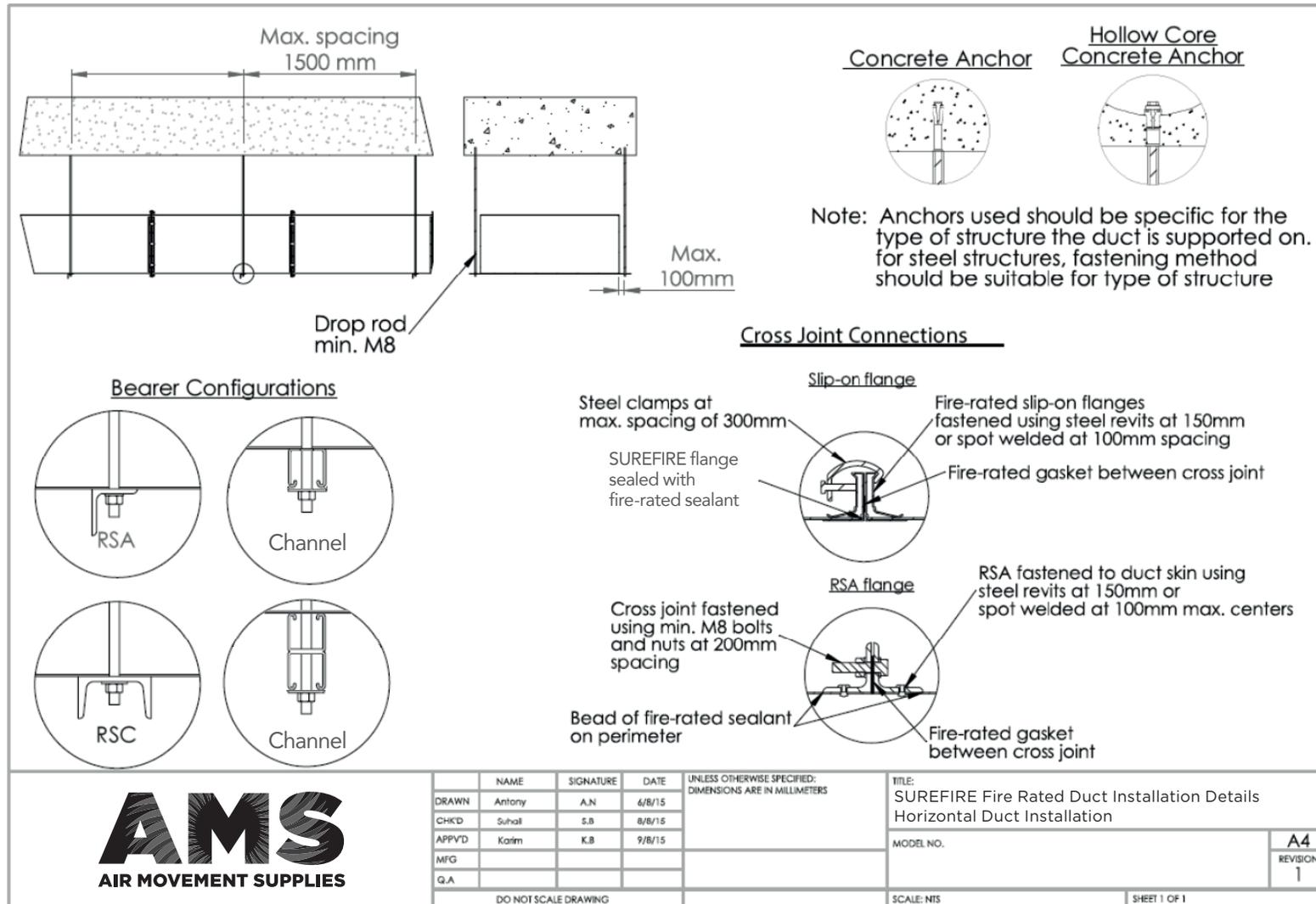
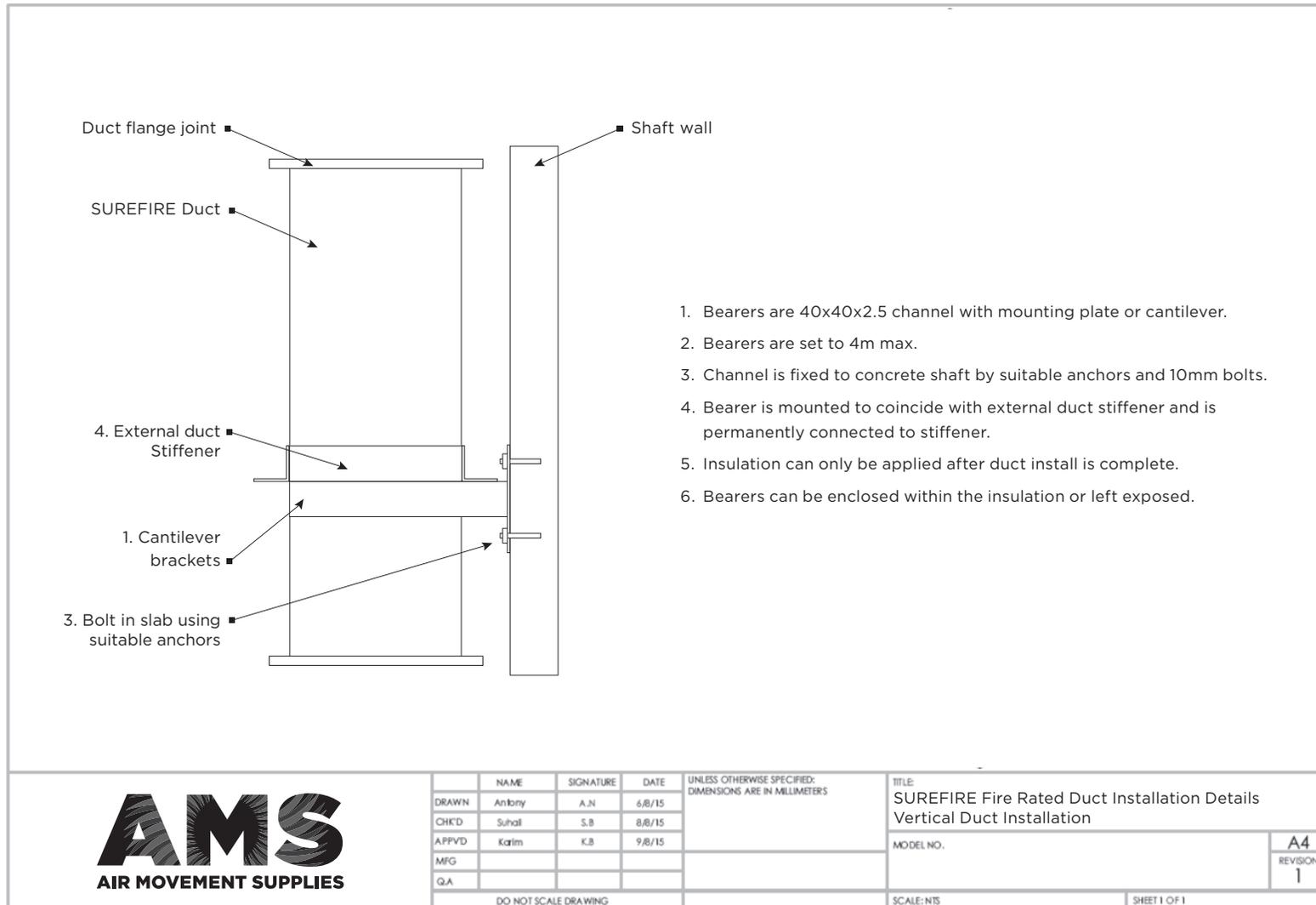


Figure 2 Vertical duct installation (before insulation)



	NAME	SIGNATURE	DATE	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS	TITLE:	
DRAWN	Anthony	A.N	6/8/15		SUREFIRE Fire Rated Duct Installation Details	
CHK'D	Suhail	S.B	8/8/15		Vertical Duct Installation	
APP'VD	Kalim	K.B	9/8/15		MODEL NO.	A4
MFG						REVISION
QA						1
DO NOT SCALE DRAWING					SCALE: NTS	SHEET 1 OF 1

Figure 3 Insulated ducts – single layer insulation

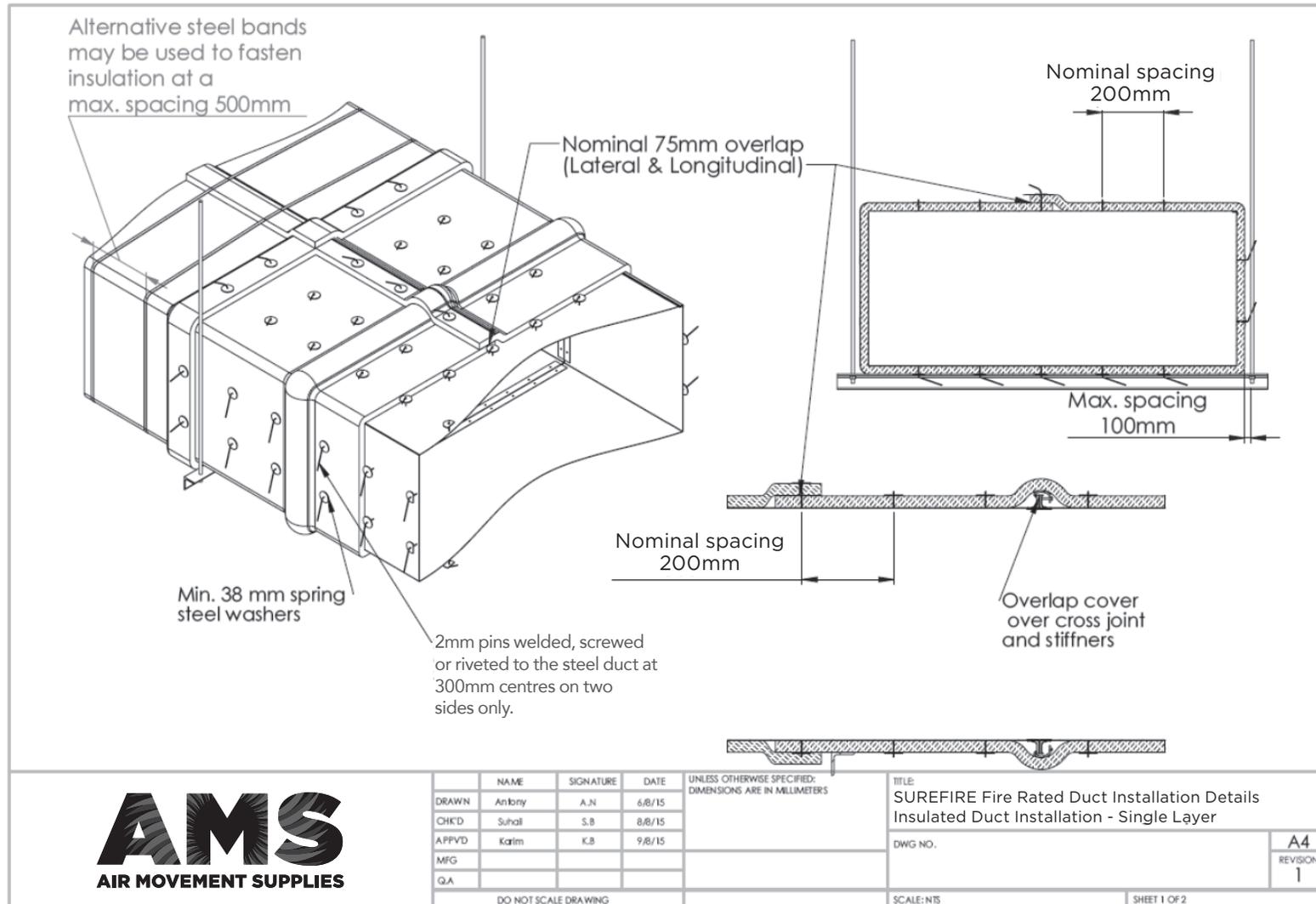


Figure 4 Insulated ducts – double layer insulation

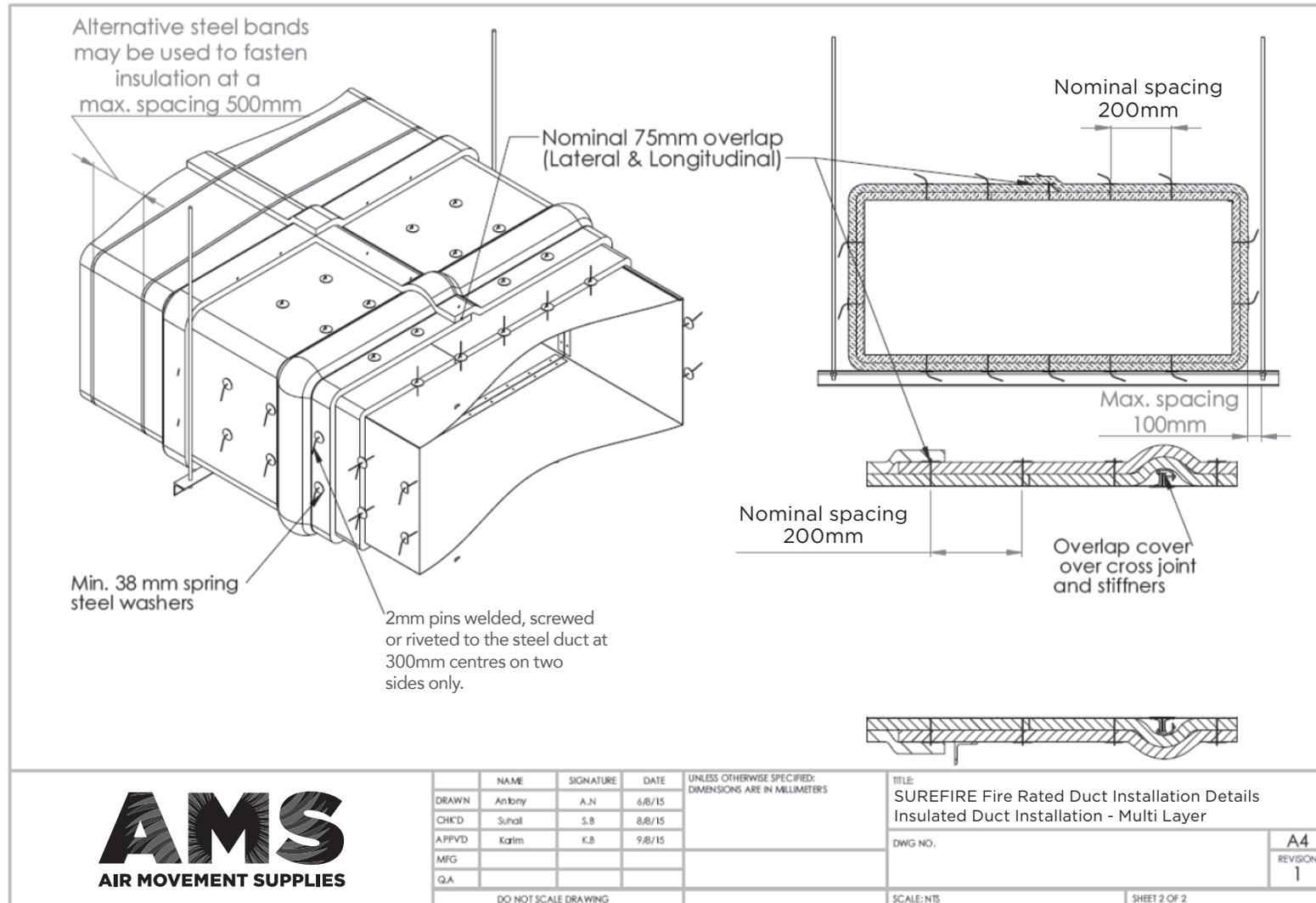


Figure 5 Ducts with internal flanges and stiffeners (For all rectangular flanged options)

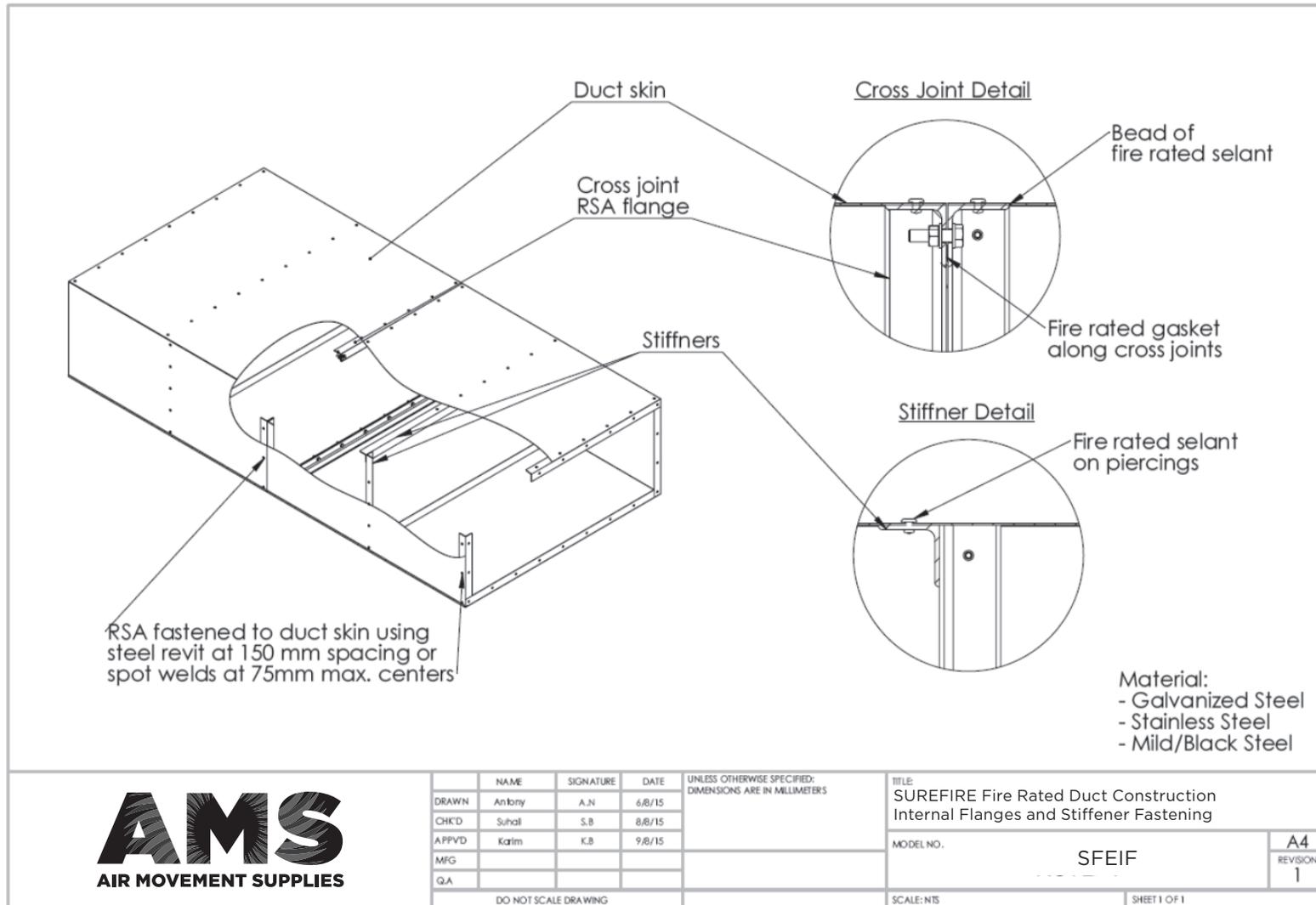
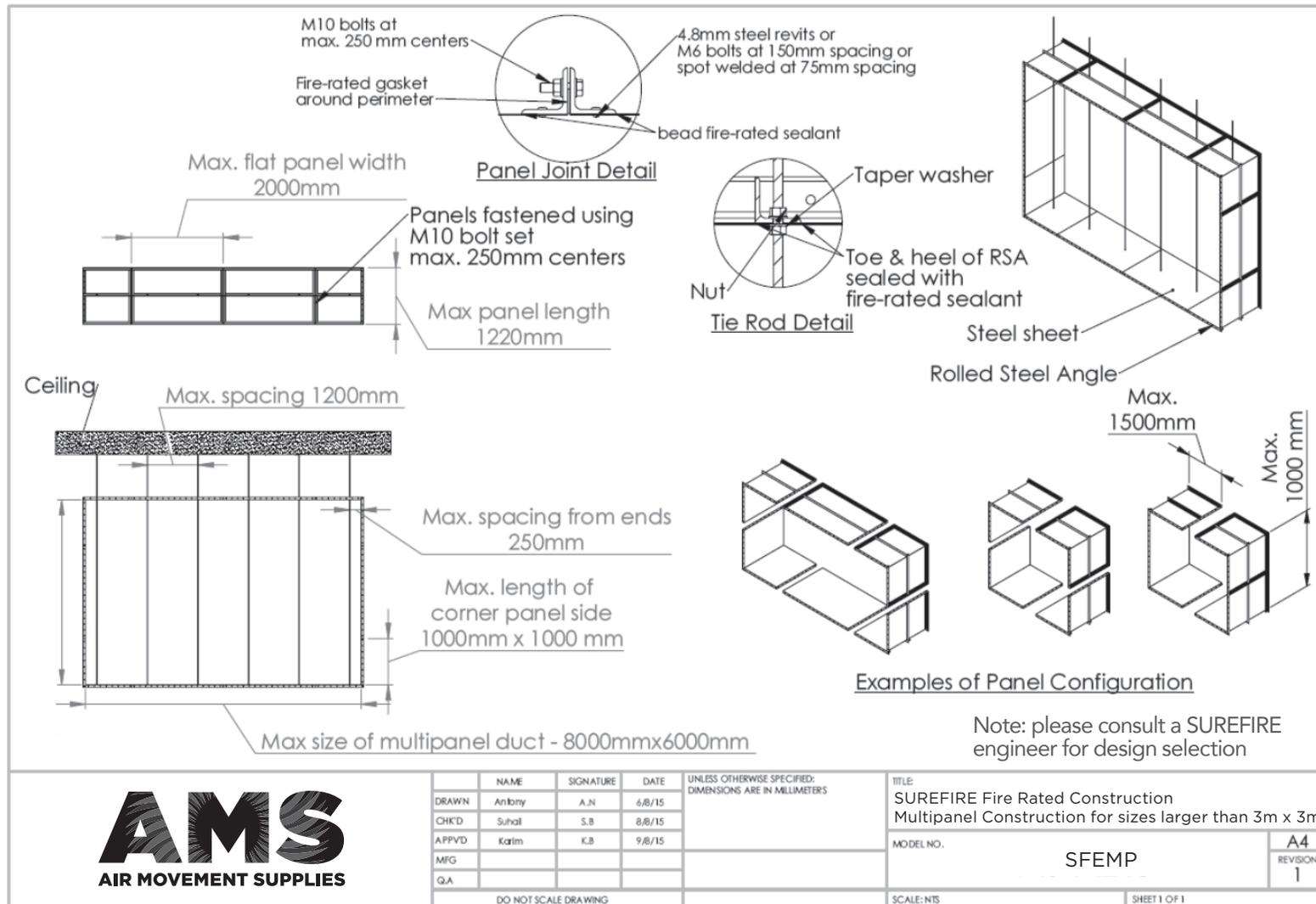


Figure 6 Multiple panel duct construction (Further detail on request)



	NAME	SIGNATURE	DATE
DRAWN	Anthony	A.N	6/8/15
CHK'D	Suhail	S.B	8/8/15
APP'VD	Karim	K.B	9/8/15
MFG			
G.A.			

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

TITLE:
SUREFIRE Fire Rated Construction
Multipanel Construction for sizes larger than 3m x 3m

MODEL NO.	SFEMP	A4
		REVISION
		1

DO NOT SCALE DRAWING

SCALE: NTS

SHEET 1 OF 1

Figure 7 Sound attenuator

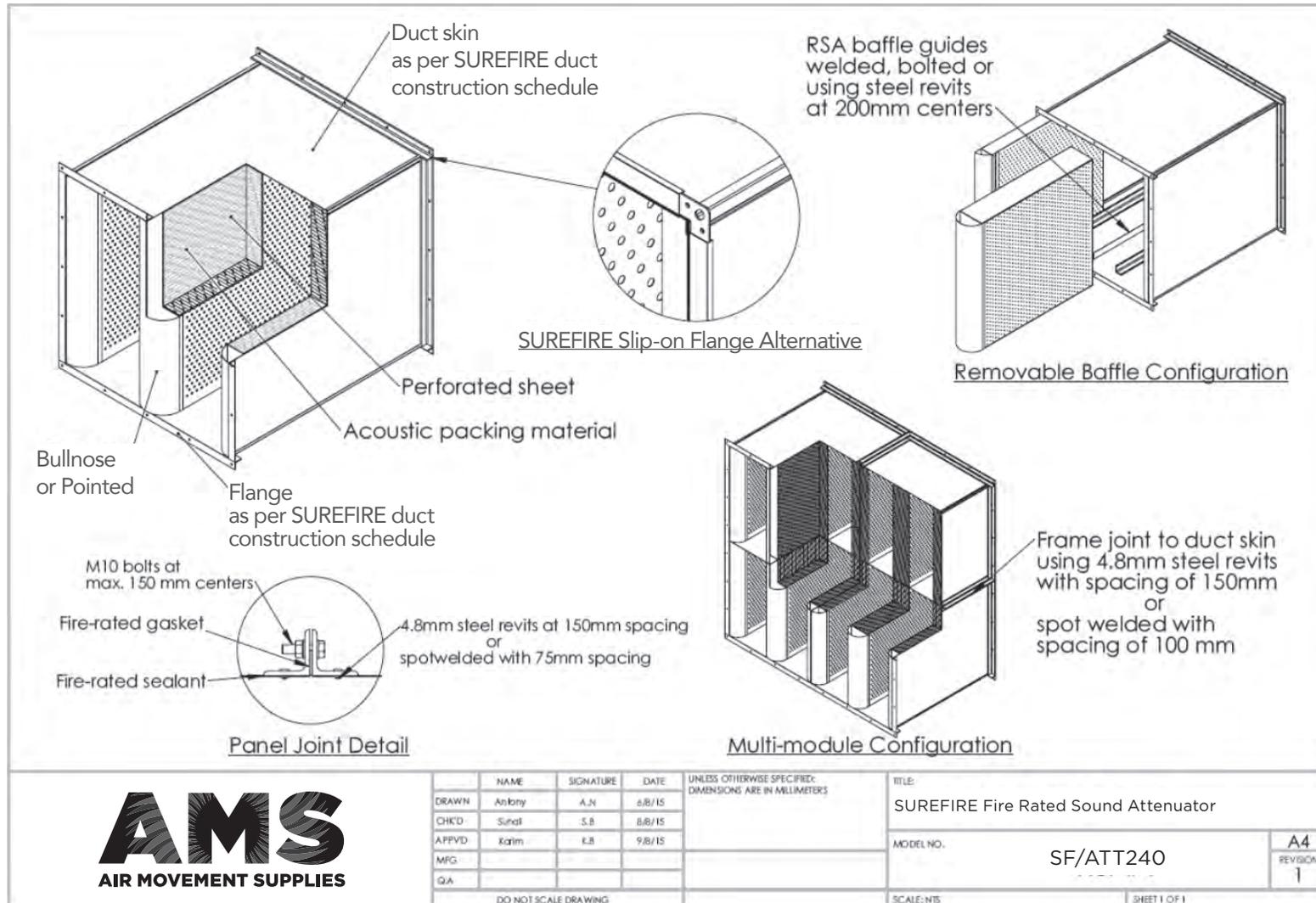


Figure 8 Access Door SureFire (Standard Range) and EnSave (Pressure Tested Range)

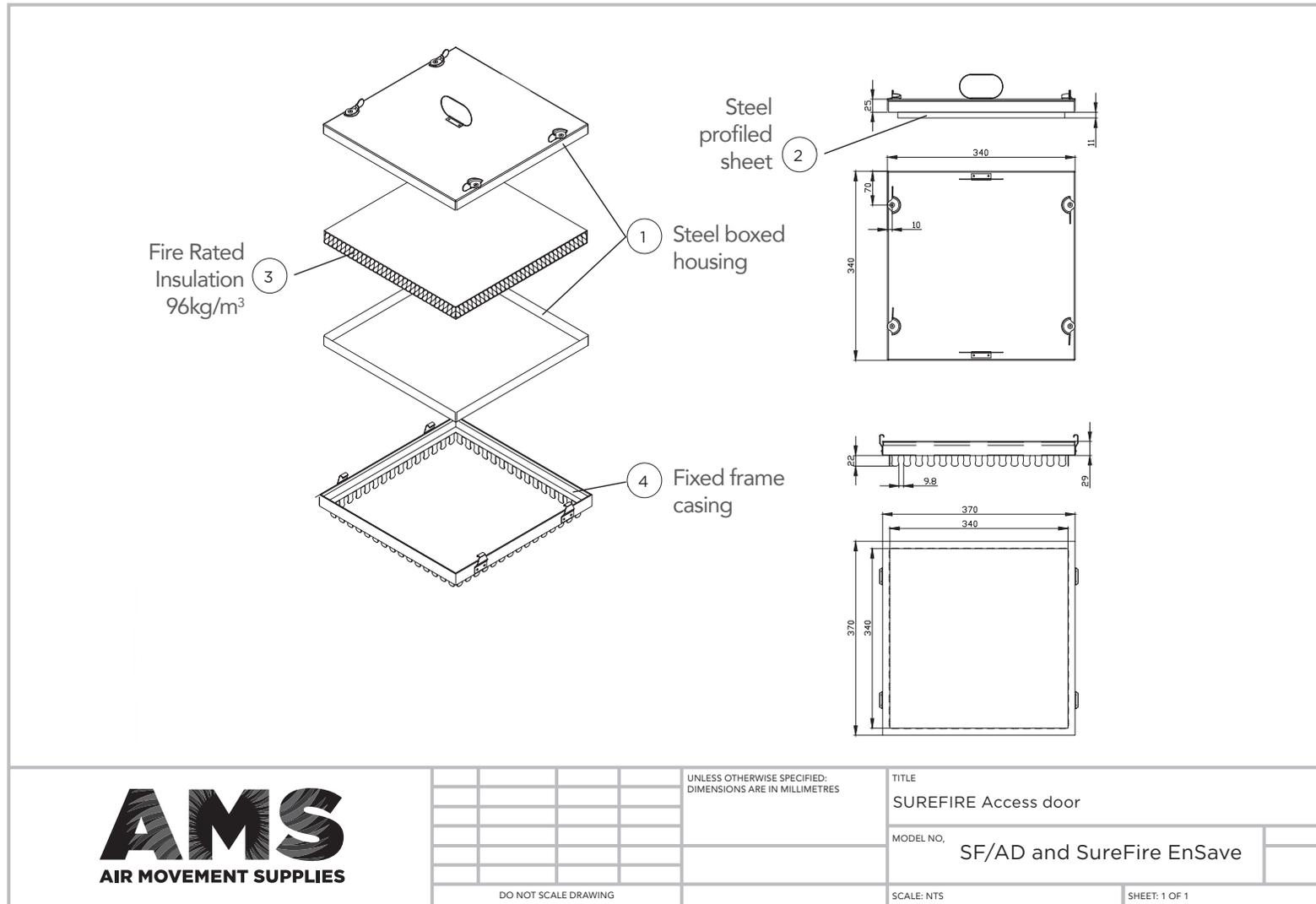


Figure 11 Uninsulated penetration seal for round duct

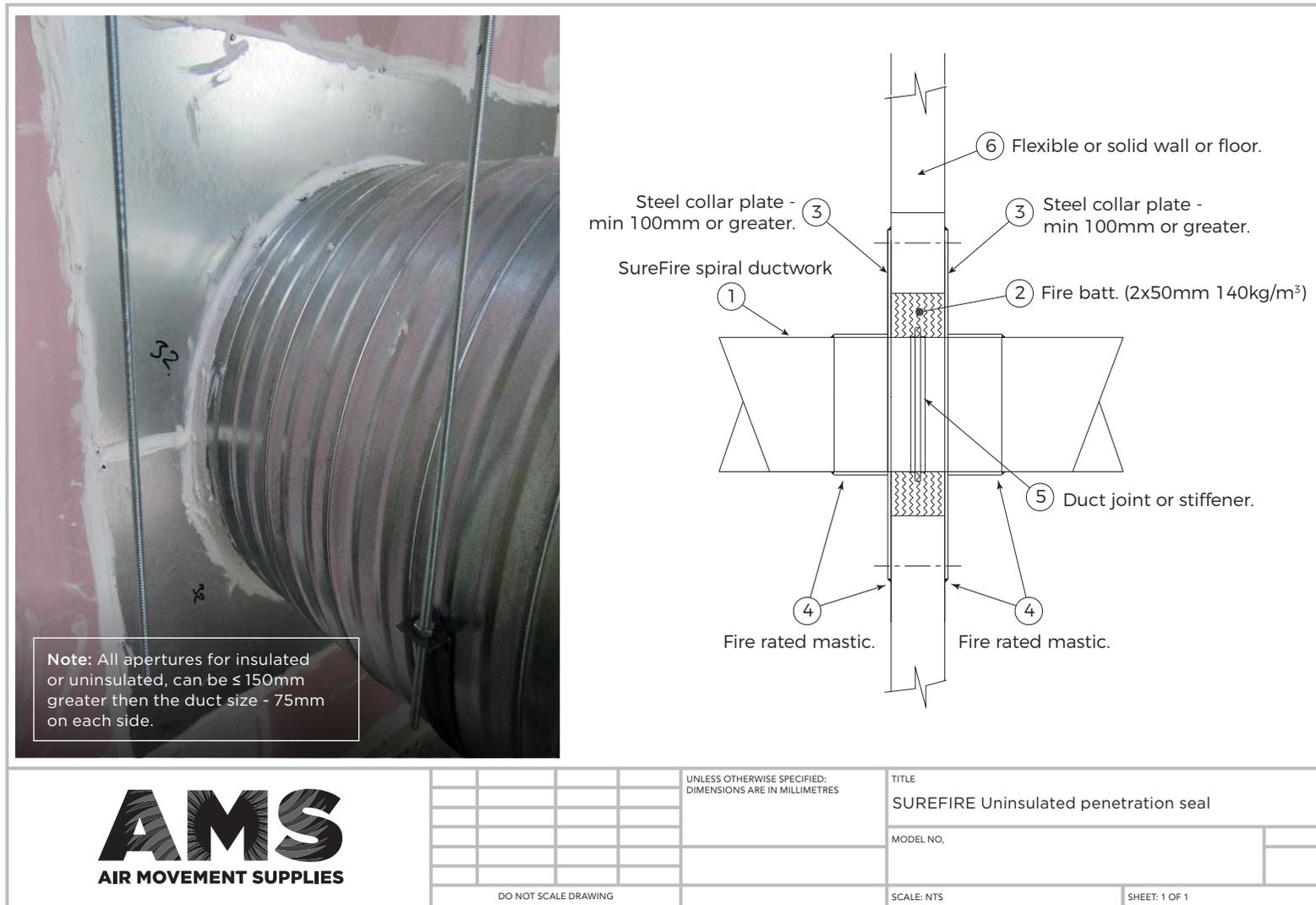


Figure 12 Insulated penetration seal for round duct



Note: All apertures for insulated or uninsulated, can be $\leq 150\text{mm}$ greater than the duct size - 75mm on each side.



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETRES

TITLE	
SUREFIRE Insulated penetration seal	
MODEL NO.	
SCALE: NTS	SHEET: 1 OF 1

DO NOT SCALE DRAWING

If the walls is considered the skeleton then the ductwork is its arteries. As such, they carry with it the life and continued healthy existence of the building, as each of it's many compartments are interconnected via this network. The integrity and substance therefore of the selected ductwork to be used in this manner must be a sober consideration to ensure that it validates all the criteria to underpin the significance of it's role. SureFire duct has become one of the most tested ductwork in Europe over the last 16 years.

In this range enclosed SureFire has been subjected to BS 476 furnaces which envelope the uninsulated duct first at 1200°C for the duration of the test which in this case in excess of 4hours with the duct remaining in tact. Think about this as it pertains to an office block and what this unique duct brings to the opportunity to save lives initially but then also to protect the very building structure. SureFire is also tested as a fully insulated duct and though in one orientation the duct is protected from the direct burden of the flames, in another scenario the insulation becomes the ever tightening noose when the duct is unable to shed its heat like wearing a big coat on a very hot day. Whether for use in car park ventilation or kitchen extract SureFire has been tested and approved for both rectangular and round ductwork and provides a complete package solution to put your mind at ease that selecting SureFire is certain to succeed.



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