

Profiles & Sections: Applications

Steel Framing System



Low Energy - Low Carbon Buildings





Contents

Introduction **3**

SFS Introduction **4-5**

SFS Advantage **6-7**

SFS Sustainability/
Environmental **8-9**

Applications
Infill/Oversail **10-11**

Sector Applications **12-13**

Product Range &
Structural Properties **14-15**

Design Considerations **16-17**

Design Service **18-21**

Construction Details **22-25**

Guidance Notes **26-37**

Fixings and Accessories **38-39**

Introduction

Kingspan Off-Site Profiles & Sections has gained its reputation by continually exceeding its customers' expectations. To be successful in the future, Kingspan Off-Site recognises the need to constantly develop and to add value at all stages of the customer relationship.

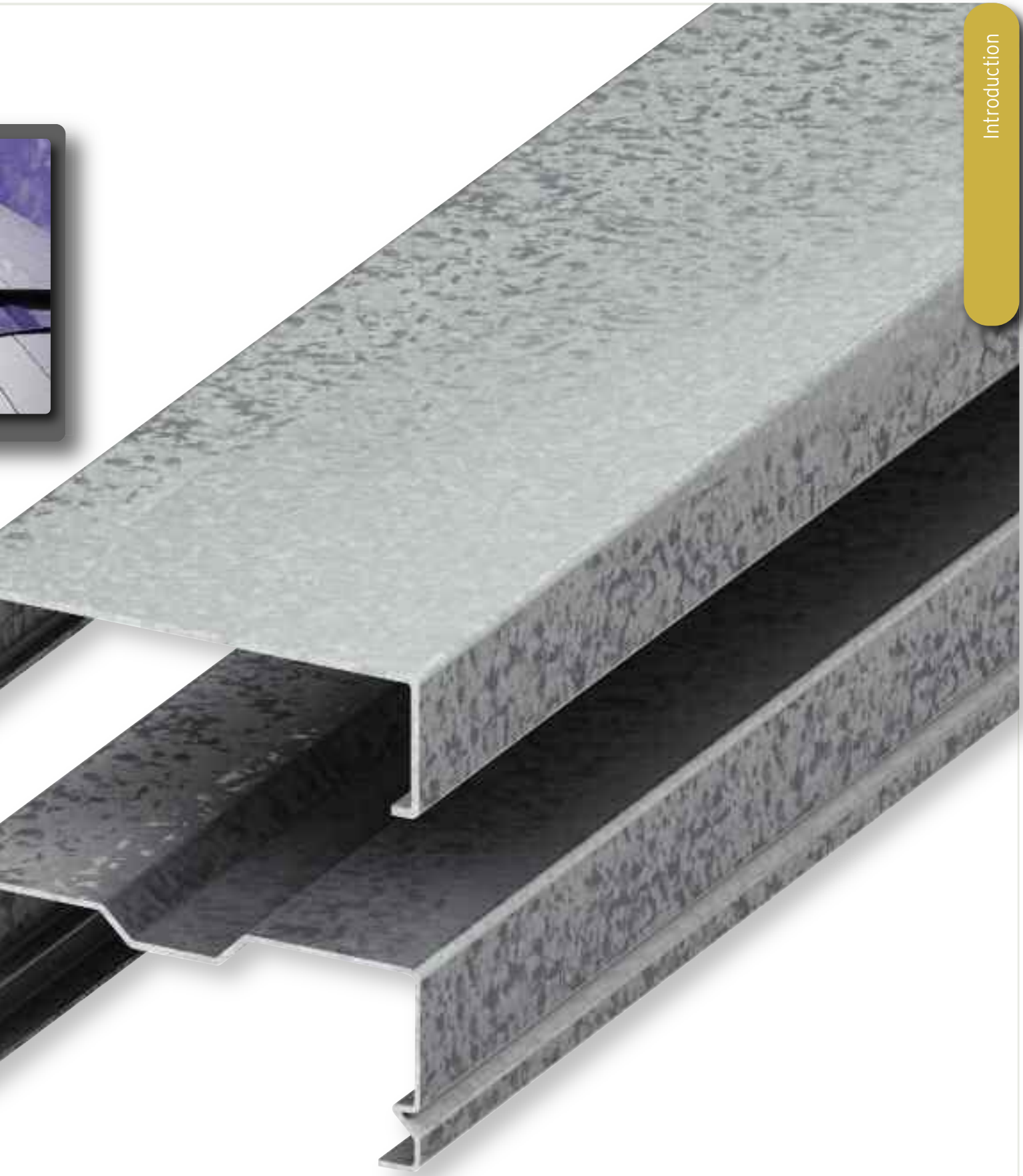
Kingspan Off-Site aims to work with like-minded organisations, helping them to develop their own businesses by contributing in three key areas:

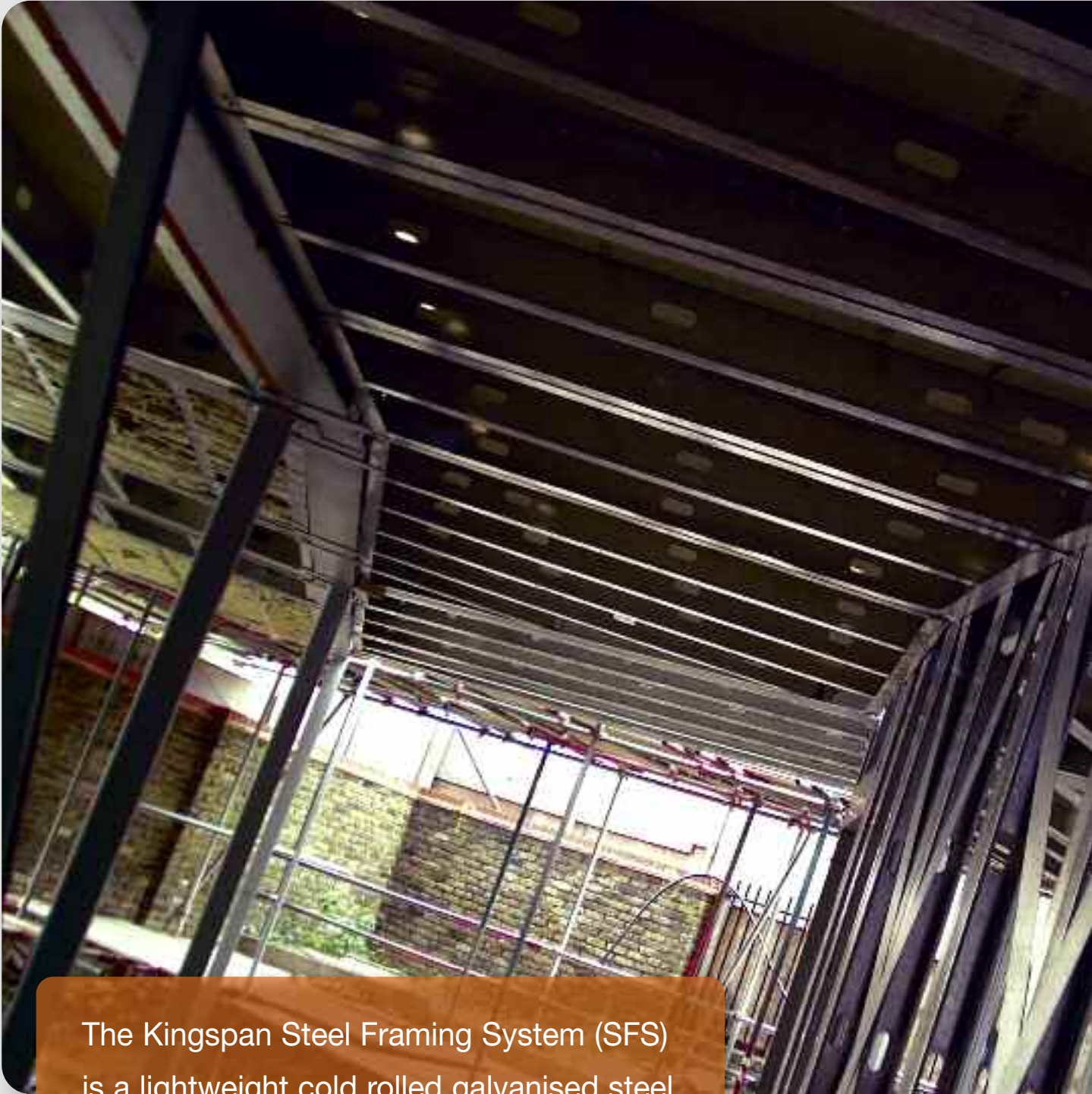
Design Creativity - delivering systems that push the conventional.

Quality Systems - that are quick and simple to install incorporating lean manufacturing costs to deliver

Affordability - for all sections of the market.

Kingspan Off-Site Profiles & Sections form genuine partnerships with customers, which is why they do not just think of Kingspan as a supplier, but as an integral member of the team.





The Kingspan Steel Framing System (SFS) is a lightweight cold rolled galvanised steel framing system for infill and oversail external framing that is assembled on-site



Kingspan Steel Framing System: Introduction

The Kingspan Steel Framing System (SFS) is a lightweight cold rolled galvanised steel framing system for infill and oversail external framing that is assembled on-site. A variety of interior and external finishes, such as traditional brickwork, architectural façade systems or aluminium rainscreen systems can be attached to Kingspan SFS.

Kingspan SFS has been designed to accommodate many architectural features such as doors, windows, brise soleil and other façade elevation design details.

Kingspan SFS is also well placed to meet the increasingly stringent requirements of the Building Regulations / Standards due to its warm frame construction. This construction technique enables Kingspan SFS to easily meet thermal performance specifications up to U-values of $0.20 \text{ W/m}^2 \cdot \text{K}$.

Kingspan SFS has been used across thousands of projects across many different sectors, in the UK, including education, retail, healthcare, commercial and Industrial.

In recent years the use of Kingspan SFS has become established in the UK and is increasingly used in preference to traditional methods such as timber, masonry and hot rolled steel structures.

Kingspan SFS incorporates cold rolled sections manufactured on highly efficient mills which supply products with tight tolerances, on short lead times at very competitive prices.



Kingspan Steel Framing System: Advantage

Kingspan Steel Framing System (SFS) has many inherent advantages and has become the first choice for many contractors due to the benefits it offers compared to traditional techniques.

The key reasons for this success are:

- Lightweight - A lightweight structure requires less costly foundations
- Predictability - Lightweight cold rolled steel sections are precision engineered products manufactured to exact dimensions ensuring exact performance resulting in less time spent on-site correcting errors and solving problems
- Cost-effectiveness - The cost of steel sections is competitive with timber. When productivity benefits are taken into account the cost of steel sections is comparable with masonry. However, Kingspan SFS delivers build times that can be over 20% faster than traditional blockwork; coupled with the fact that making a building weathertight can save up to 55% of the time on-site compared to traditional systems. This is due to the fact that wet trades are removed from the critical path, thereby enabling client handover and business income streams to start earlier
- Recyclability - Steel sections are 100% recyclable. This is increasingly important as the lifetime environmental impact of the buildings is increasingly scrutinised to meet tighter Government legislation
- Performance - Warm frame constructions from lightweight cold rolled steel sections can be designed to easily achieve high levels of structural, fire, acoustic and thermal performance achieving a typical U-value of 0.25 W/m²·K and an acoustic performance of 55/65 dB
- Steel is dimensionally stable and does not suffer from shrinkage
- Familiarity - The benefits of lightweight cold rolled steel construction are simple and well understood by the whole building team from designer to installer
- System Flexibility - The system can incorporate doors, windows, louvres, brise soleil, penetrations and other elevation design details as well as a variety of finishes such as:

Conventional systems

- Brickwork
- Blockwork

Render Systems

- Insulated panel render
- Blockwork render

Rainscreen Systems

- Terracotta tiles
- Rainscreen render
- Timber
- Aluminium



Kingspan Steel Framing System (SFS) has many inherent advantages and has become the first choice for many contractors due to the benefits it offers compared to traditional techniques



Kingspan Steel Framing Sections: Sustainability / Envi



Sustainability

With the world population doubling every 40 years, and raw material usage doubling every 20 years, the natural resources that are depended upon urgently need to be managed in a sustainable manner. The construction industry needs to prevent irresponsible material and energy use, and is required to minimise the inevitable impact the industry has on the environment, so that living standards are not degraded through congestion, pollution and weather pattern changes.

The minimisation of waste is not the only way in which construction professionals can positively impact on the ecological impact of the industry. The Government has set out distinct areas where the construction industry can contribute to a sustainable future, such as the Code for Sustainable Homes, and has placed the burden of responsibility squarely onto regulatory bodies and leading companies to develop strategies and initiatives to contribute to a wider campaign of sustainable resource use. The areas that impact directly onto the steel construction industry are;

- 1 Material use reduction at source and responsible ore extraction methods
- 2 Increased recycling of existing steel from decommissioned structures encouraged by the Landfill Tax Credit System
- 3 Greater implementation of ecologically focused regulations and standards, in particular, reducing energy consumption of buildings in use
- 4 Increased use of supply chain partnerships to eliminate waste and poor decision making
- 5 Increased use of off-site Manufacturing techniques and technologies to eliminate waste and encourage recycling

- 6 Design for brownfield sites and re-use of existing structures for new use
- 7 Increased understanding and sharing of technical information to improve efficiency
- 8 Environmental reporting (BS/EN/ISO 14001) to encourage active monitoring of environmental effects

Useful links regarding the use of steel as a sustainable material:

SCI www.steel-sci.org

Steel Homes Group www.steelhomesgroup.com

Working with a range of partners, Kingspan Off-Site is engaged in providing advanced modern methods of construction utilising high levels of off-site manufacture which is delivering more sustainable construction techniques.

Kingspan Off-Site fully supports the development of innovative forms of construction which ultimately yield more affordable buildings through:

- Better construction quality
- Improved building performance
- Reduced production and installation waste
- Increased speed of construction, reducing finance costs

Kingspan Off-Site has a track record of delivering a range of modern methods of construction appropriate to the project size and type. These include:

- Semi-volumetric housing projects
- Apartment construction using panelised walls and floors
- Optimised kit of parts constructions erected on-site

Environmental



The construction industry needs to prevent irresponsible material and energy use

Environmental

There are a number of ways in which steel can be used as a sustainable choice for architects, developers and main contractors when considered alongside traditional forms of construction. These include;

- 1 Better overall building performance
- 2 100% recyclable material
- 3 Greater recovery of material from demolished and decommissioned structures
- 4 Dimensional stability
- 5 Design technologies

Warm frame steel construction regularly exceeds Building Regulations / Standards and can be thermally more efficient than masonry equivalents, creating more sustainable residential, public sector and commercial buildings by using less energy in use. This is very important if we consider that the energy associated with the occupation of buildings, over a 60 year period, is up to 10 times more than the energy used to construct the building.

Steel loses none of its material properties during recycling and new steel components can constitute up to 67% of recycled material. Raw material conversion has seen a significant reduction in both energy use and emissions when compared to aggregate based conversions. Cold forming of steel is a highly efficient method of converting low material yields into high performance structural components using low energy forming techniques.

Using a factory produced, finished product not only reduces on-site waste, but can also reduce the need for rework after completion. Instances of plasterboard damage, by fixings as well as shrinkage and expansion of wet applied products, is significantly reduced due to the dimensional stability of formed steelwork.

The use of advanced computer aided design software has reduced design errors; often the cause of material waste. Parametric intelligent CAD systems have meant the design process is now reducing unnecessary waste and reworks resulting from design errors.

Applications - Infill

External Walls

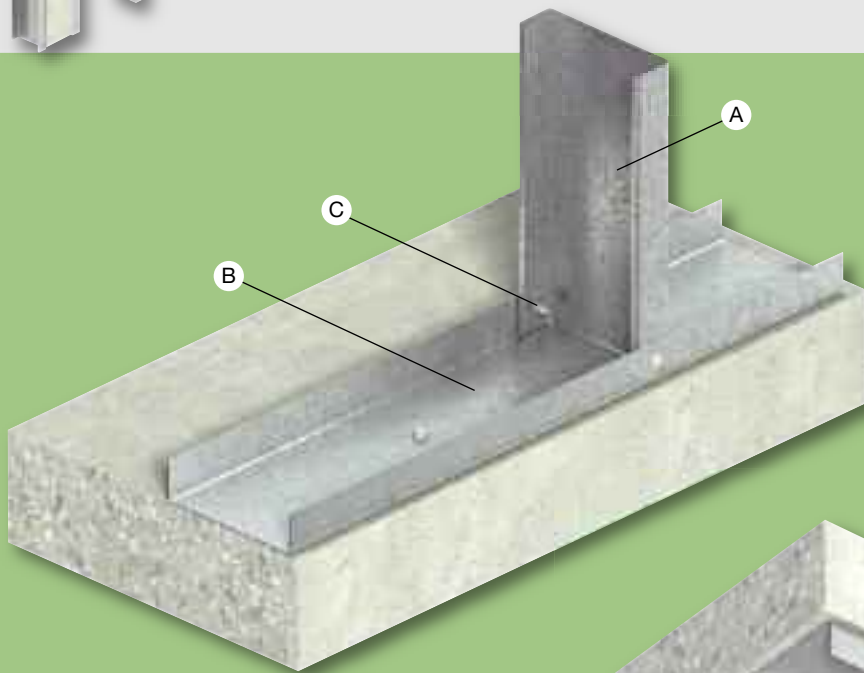
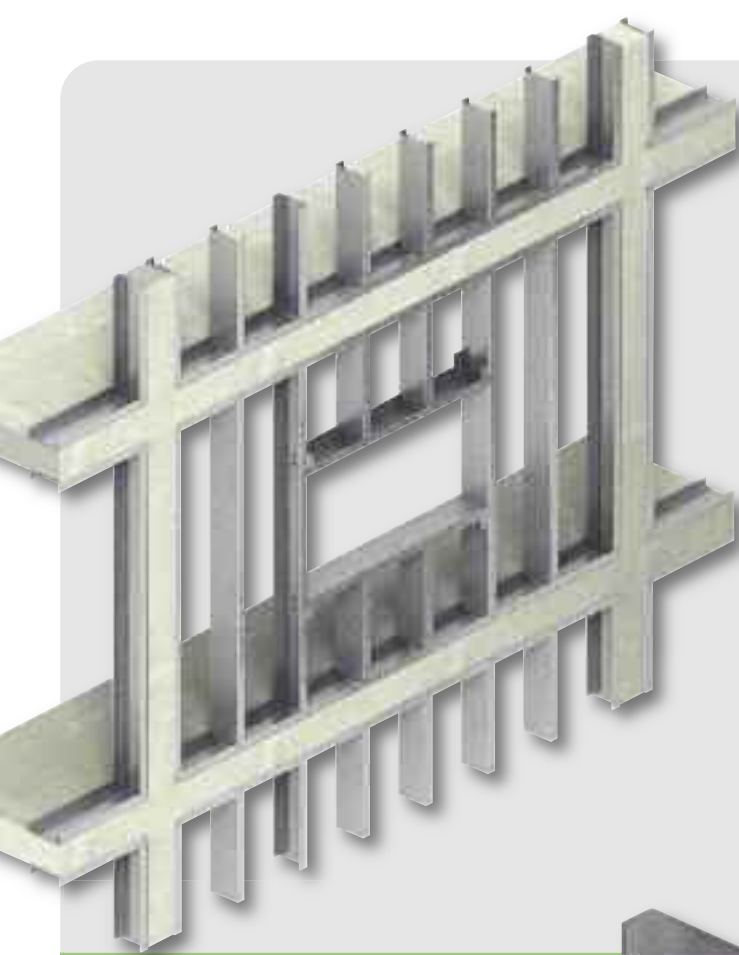
The Infill system comprises Kingspan SFS within the superstructure of the building. Kingspan SFS sits vertically between the slab surface and either the steel edge beam or the soffit of the slab above.

8.1: Fixing of Bottom Track

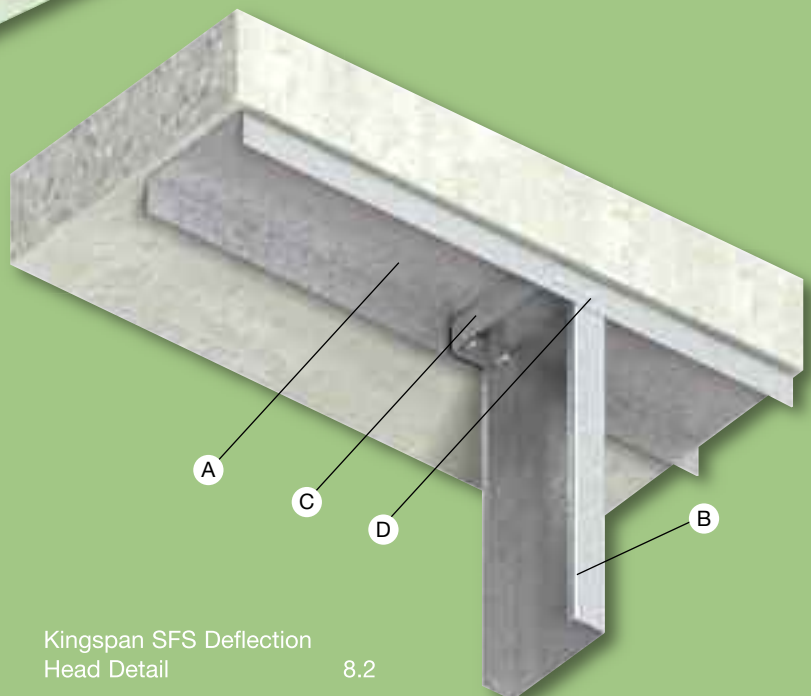
- A: SFS stud component
- B: SFS base track component
- C: mechanical screw fixing

8.2: Fixing of Head Track

- A: SFS head track component
- B: SFS stud component
- C: deflection clip
- D: mechanical screw fixing



Kingspan SFS Base Detail 8.1



Kingspan SFS Deflection Head Detail

8.2

Applications - Oversail

External Walls

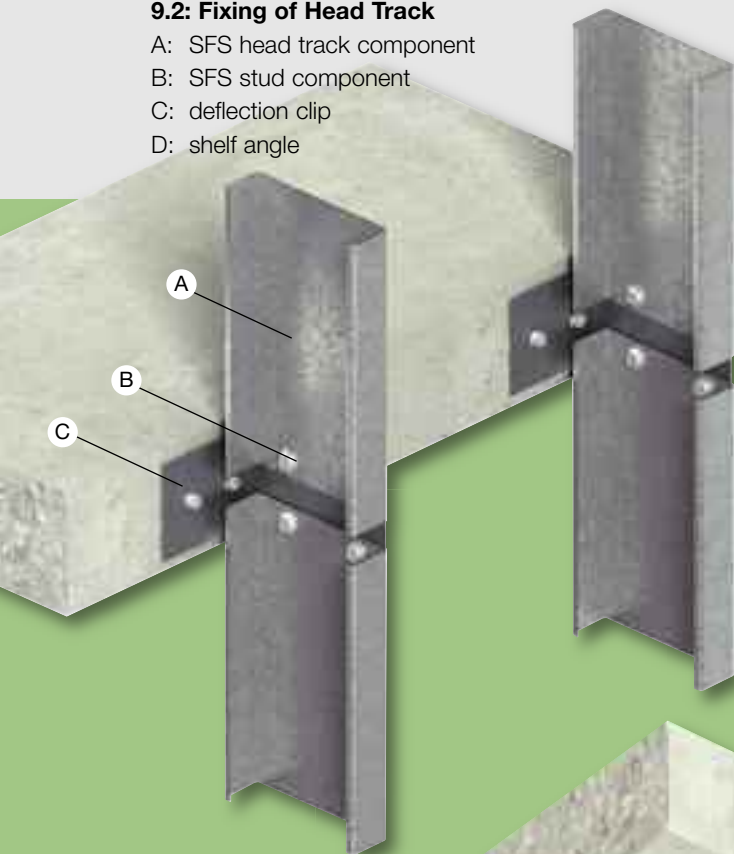
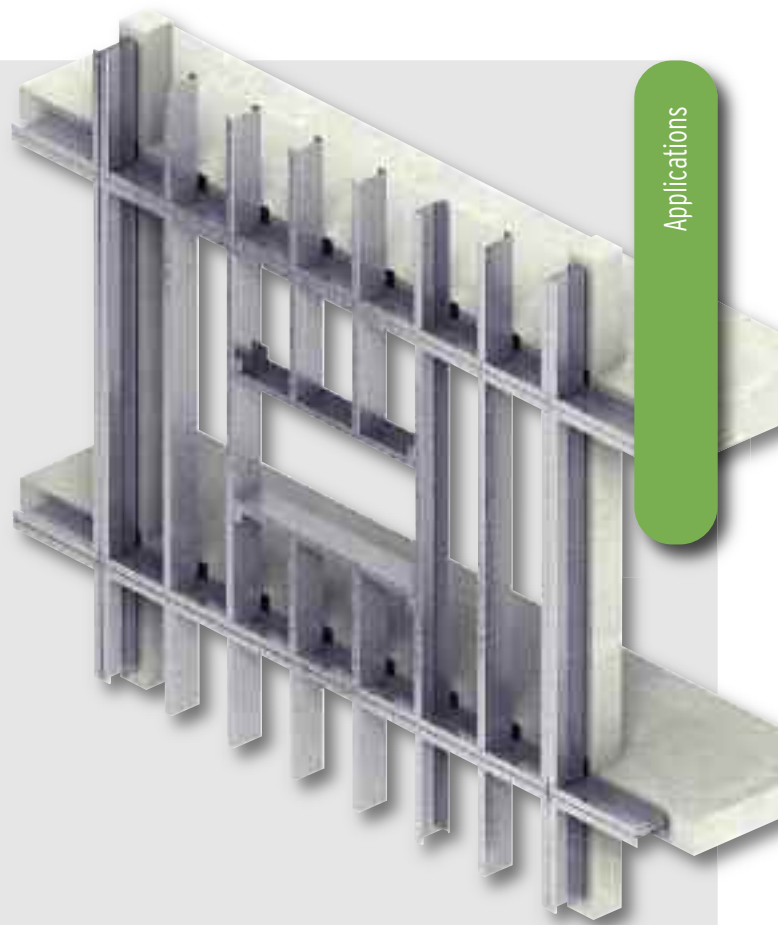
The oversail system composes Kingspan Off-Site SFS framing outside the plan area of the superstructure of a building. The SFS spans vertically between brackets fixed to the slab surface and either the steel edge beam or the soffit of the slab above.

9.1: Fixing of Bottom Track

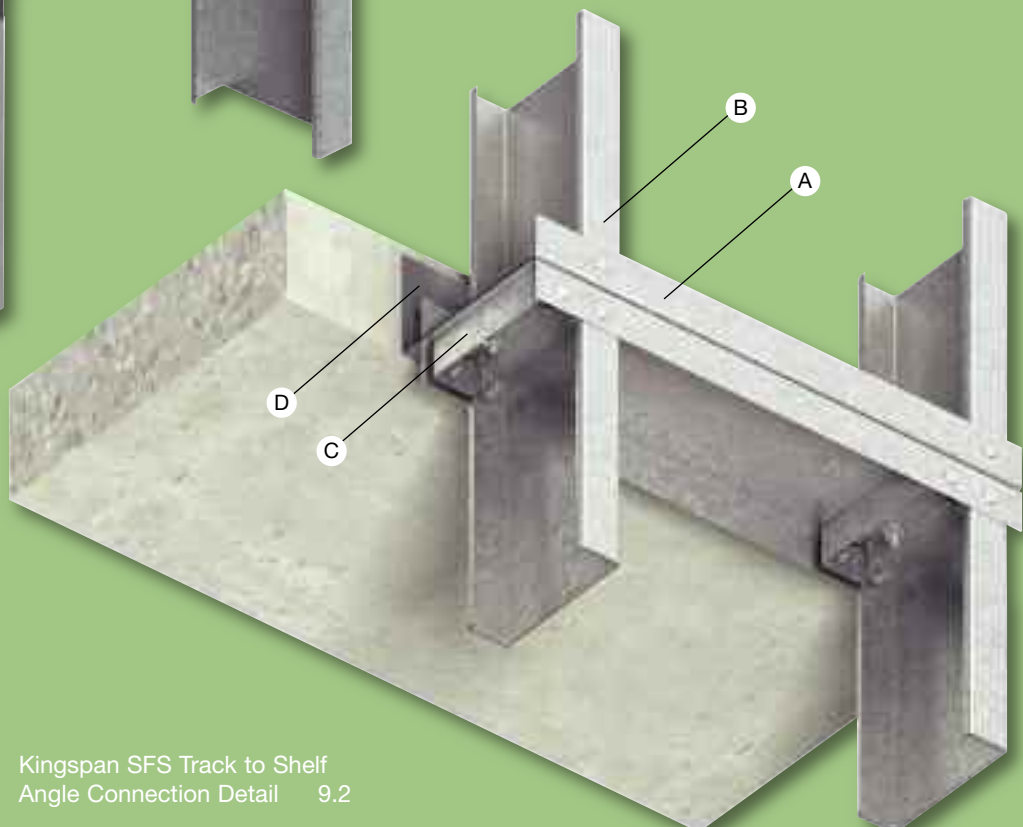
- A: SFS stud component
- B: slotted deflection cleat
- C: mechanical screw fixing

9.2: Fixing of Head Track

- A: SFS head track component
- B: SFS stud component
- C: deflection clip
- D: shelf angle



Kingspan SFS Slotted Deflection Bracket Connection Detail 9.1



Kingspan SFS Track to Shelf Angle Connection Detail 9.2



Lingham Court



Greenwich Millenium Village



Warwick University



Chelsea Bridge Wharf



Oriel School



Christies Hospital

Sector Applications

Residential

Residential Applications

Steel framing has been used in a variety of applications and industries, however it has been particularly successful in the high-rise residential market. Developments are often built on tight brown-field sites and there is pressure to complete the project under very tight delivery time scales.

Architects are required to make all of the buildings unique often by incorporating a mix of renders, and architectural details. All of these factors, and more, make Kingspan SFS the first choice method of construction.

Educational

The education market has recently received massive levels of investment from Government. This has resulted in the Building Schools for the Future project under which Local Authorities have created a large number of new building projects for schools.

Kingspan SFS has become the first choice amongst architects and builders due to its fast construction technique and its ability to meet the sustainability, thermal and acoustic requirements.



Northampton Academy



Astra Zenica



Dudley Cinema



Derby City Hospital



The Lauries



Blackpool Victoria



Manchester Royal Infirmary

Healthcare

Healthcare Applications

The healthcare market has also recently received massive levels of investment from Government. This has resulted in the building of a number of hospitals and the extension / refurbishment of others.

Kingspan SFS has become the first choice amongst architects and builders due to its fast construction technique and its ability to meet the sustainability, thermal and acoustic requirements.

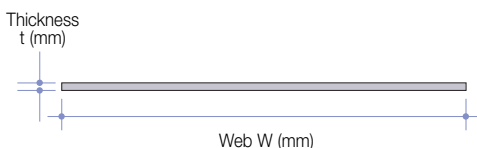
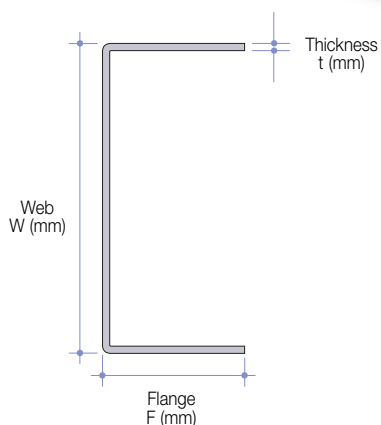
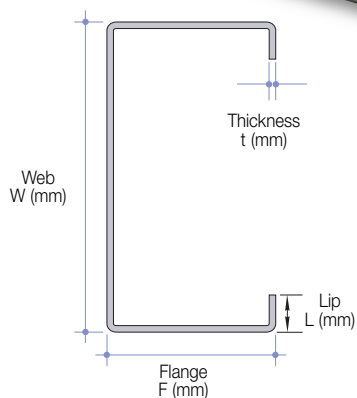
Commercial /Leisure

The commercial and leisure market has been particularly buoyant over the past few years as a result of ongoing investment across many different segments. This investment has resulted in the continued development of new shopping centres, offices, hotels and cinemas etc... all of which have very similar requirements for the design of distinctive buildings, that can be erected quickly to enable clients to realise a faster return on their investment.



Leavesden Park

Product Range



Kingspan SFS components are manufactured from galvanized steel type S390GD+Z275 NAC, with a yield strength of 390 MPa supplied in accordance with BS EN 10147:2000.

The full range is shown below. Further product sizes can be made available subject to agreement.

Kingspan SFS Stud and Joist sizes

Section Ref.	Type	W (mm)	F (mm)	L (mm)	T (mm)
C070050150	70 Stud	70.0	50.0	10.0	1.5
C070070200	70 Stud	70.0	70.0	14.0	2.0
C100050120	100 Stud	100.0	50.0	10.0	1.2
C100070120	100 Stud	100.0	70.0	14.0	1.2
C100070160	100 Stud	100.0	70.0	14.0	1.6
C100070200	100 Stud	100.0	70.0	14.0	2.0
C125050120	125 Stud	125.0	50.0	10.0	1.2
C125070120	125 Stud	125.0	70.0	14.0	1.2
C125070160	125 Stud	125.0	70.0	14.0	1.6
C125070200	125 Stud	125.0	70.0	14.0	2.0
C150050120	150 Stud	150.0	50.0	10.0	1.2
C150070120	150 Stud	150.0	70.0	14.0	1.2
C150070160	150 Stud	150.0	70.0	14.0	1.6
C150070200	150 Stud	150.0	70.0	14.0	2.0
C200050120	200 Stud	200.0	50.0	10.0	1.2
C200070120	200 Stud	200.0	70.0	14.0	1.2
C200070160	200 Stud	200.0	70.0	14.0	1.6
C200070200	200 Stud	200.0	70.0	14.0	2.0
C250070120	250 Stud	250.0	70.0	14.0	1.2
C250070160	250 Stud	250.0	70.0	14.0	1.6
C250070200	250 Stud	250.0	70.0	14.0	2.0
C300070200	300 Stud	300.0	70.0	14.0	2.0
U074055150	74 Track	74.0	55.0	-	1.5
U074070200	74 Track	74.0	69.0	-	2.0
U104055120	104 Track	104.0	55.5	-	1.2
U104068200	104 Track	104.0	67.5	-	2.0
U129055120	129 Track	129.0	55.5	-	1.2
U129068200	129 Track	129.0	68.0	-	2.0
U154055120	154 Track	154.0	55.5	-	1.2
U154068200	154 Track	154.0	67.5	-	2.0
U204055120	204 Track	204.0	55.5	-	1.2
U204067200	204 Track	204.0	67.0	-	2.0
U254055120	254 Track	254.0	55.5	-	1.2
U254067200	254 Track	254.0	67.0	-	2.0
U304067200	304 Track	304.0	67.0	-	2.0

Bracing straps

Product Code	Quantity	Gauge (mm)
FS10012	1 x 3.0/4.0	1.2
FS3809	1 x 3.0/4.0	0.9

Structural Properties

Section Properties -Steel Stud and Track Sections

Section Ref.	Mass	W	F	L	T	Ixx	Ixx in	Iyy	Zxx	Zxx in	Zyy	rxx	ryy	P0	es	Q
	(Kg/m)	(mm)	(mm)	(mm)	(mm)	(cm ⁴)	Bending (cm ⁴)	(cm ⁴)	(cm ³)	Bending (cm ³)	(cm ³)	(cm)	(cm)	(N/mm)	(mm)	
'C' Stud Section Range						Structural Properties										
C070050150	2.11	70.0	50.0	10.0	1.5	22.91	22.49	9.07	6.55	6.35	3.01	2.92	1.84	390.00	1.18	0.89
C070070200	3.54	70.0	70.0	14.0	2.0	39.87	38.95	29.82	11.40	10.94	7.60	2.97	2.57	390.00	0.41	0.93
C100050120	1.96	100.0	50.0	10.0	1.2	41.32	38.95	8.31	8.27	7.51	2.53	4.07	1.82	366.21	4.36	0.67
C100070120	2.40	100.0	70.0	14.0	1.2	53.98	45.62	20.82	10.80	8.21	4.82	4.21	2.61	366.21	4.77	0.56
C100070160	3.21	100.0	70.0	14.0	1.6	71.57	66.30	27.46	14.32	12.60	6.41	4.19	2.59	385.54	3.39	0.73
C100070200	4.00	100.0	70.0	14.0	2.0	88.64	86.50	33.83	17.74	17.01	7.97	4.17	2.58	390.00	2.04	0.87
C125050120	2.19	125.0	50.0	10.0	1.2	68.86	65.28	8.92	11.02	10.11	2.59	4.97	1.79	347.37	5.83	0.60
C125070120	2.63	125.0	70.0	14.0	1.2	89.01	76.30	22.48	14.25	11.11	4.95	5.16	2.59	347.37	6.62	0.52
C125070160	3.51	125.0	70.0	14.0	1.6	118.22	110.10	29.65	18.92	16.83	6.59	5.14	2.58	371.52	5.31	0.68
C125070200	4.39	125.0	70.0	14.0	2.0	146.68	143.12	36.53	23.48	22.53	8.19	5.12	2.56	385.82	3.88	0.80
C150050120	2.42	150.0	50.0	10.0	1.2	105.11	100.53	9.41	14.02	13.06	2.63	5.85	1.75	328.52	7.00	0.55
C150070120	2.86	150.0	70.0	14.0	1.2	134.48	116.71	23.87	17.94	14.31	5.05	6.08	2.56	328.52	8.21	0.48
C150070160	3.82	150.0	70.0	14.0	1.6	178.84	167.29	31.49	23.85	21.40	6.73	6.07	2.55	357.51	6.97	0.63
C150070200	4.78	150.0	70.0	14.0	2.0	222.18	216.98	38.80	29.63	28.50	8.36	6.05	2.53	374.66	5.56	0.74
C200050120	2.87	200.0	50.0	10.0	1.2	207.35	201.24	10.17	20.74	19.79	2.69	7.53	1.67	290.82	8.73	0.47
C200070120	3.31	200.0	70.0	14.0	1.2	260.38	232.06	26.07	26.04	21.74	5.20	7.86	2.49	290.82	10.72	0.42
C200070160	4.43	200.0	70.0	14.0	1.6	346.86	328.47	34.39	34.69	31.81	6.92	7.84	2.47	329.48	9.57	0.54
C200070200	5.55	200.0	70.0	14.0	2.0	431.66	423.38	42.39	43.17	41.85	8.60	7.82	2.45	352.36	8.24	0.64
C250070120	3.77	250.0	70.0	14.0	1.2	438.95	401.63	27.74	35.12	30.60	5.30	9.57	2.41	253.13	12.58	0.38
C250070160	5.05	250.0	70.0	14.0	1.6	585.38	561.54	36.60	46.84	43.88	7.06	9.55	2.39	301.45	11.49	0.48
C250070200	6.32	250.0	70.0	14.0	2.0	729.33	718.82	45.10	58.36	57.03	8.77	9.53	2.37	330.05	10.21	0.57
C300070200	7.09	300.0	70.0	14.0	2.0	1127.44	1115.50	47.22	75.17	73.94	8.89	11.18	2.29	307.74	11.71	0.51

The table below gives the current section range available from our manufacturing centres.²

Section Ref.	Mass	W	F	L	T	Ixx	Ixx in	Iyy	Zxx	Zxx in	Zyy	rxx	ryy	P0	es	Q
	(Kg/m)	(mm)	(mm)	(mm)	(mm)	(cm ⁴)	Bending (cm ⁴)	(cm ⁴)	(cm ³)	Bending (cm ³)	(cm ³)	(cm)	(cm)	(N/mm)	(mm)	
'U' Stud Section Range						Structural Properties										
U074055150	2.08	74.0	55.0	-	1.5	25.44	19.49	8.55	6.88	4.51	2.29	3.10	1.80	390.00	4.27	0.49
U074070200	3.20	74.0	69.0	-	2.0	40.63	31.51	20.92	10.99	7.29	4.67	3.16	2.27	390.00	2.14	0.60
U104055120	1.94	104.0	55.5	-	1.2	44.14	32.83	7.83	8.49	5.39	1.95	4.23	1.78	363.20	7.22	0.31
U104068200	3.62	104.0	67.5	-	2.0	85.12	67.30	22.10	16.37	11.30	4.73	4.30	2.19	390.00	5.41	0.48
U129055120	2.17	129.0	55.5	-	1.2	72.17	54.98	8.35	11.19	7.41	2.01	5.12	1.74	344.35	7.14	0.26
U129068200	4.02	129.0	68.0	-	2.0	139.33	111.17	24.15	21.61	15.20	4.95	5.22	2.17	384.03	6.77	0.41
U154055120	2.39	154.0	55.5	-	1.2	108.80	84.63	8.77	14.13	9.69	2.05	5.98	1.70	325.50	6.85	0.23
U154068200	4.39	154.0	67.5	-	2.0	207.88	168.26	24.96	27.00	19.49	4.99	6.10	2.11	372.88	7.16	0.35
U204055120	2.85	204.0	55.5	-	1.2	211.54	170.27	9.42	20.74	15.04	2.11	7.64	1.61	287.81	5.55	0.20
U204067200	5.14	204.0	67.0	-	2.0	398.47	330.05	26.41	39.07	29.38	5.08	7.80	2.01	350.57	7.05	0.28
U254055120	3.31	254.0	55.5	-	1.2	359.59	297.52	9.88	28.32	21.46	2.15	9.25	1.53	250.11	4.33	0.18
U254067200	5.92	254.0	67.0	-	2.0	672.00	566.58	27.86	52.92	41.03	5.19	9.45	1.92	328.26	5.55	0.26
U304067200	6.69	304.0	67.0	-	2.0	1039.61	889.85	28.97	68.40	54.38	5.27	11.06	1.85	305.95	4.35	0.23

² Further sections are available upon request. Please contact your ASM for further details.

Design Considerations



Getting projects up and running as quickly and effectively as possible is critical to the success of the design phase. With the growing use of sub-contract designers on construction projects, the responsibility for the production and dissemination of design information, and drawn material, can lead to unnecessary confusion and delay. To avoid this confusion, Kingspan Off-Site has set out the information it requires, explains why it needs it and who is responsible for producing it.

Architect

Project Structural Engineer Plan, section, detail and elevation drawings in AutoCAD 2005 format. Kingspan Off-Site needs this information to assess the architectural detailing, setting out and positioning of Kingspan SFS. Getting this information as a DWG file is essential to starting design works as PDF or hard copy information adds unnecessary drafting time and risks misinterpretation of architectural intent.

Door & Window Schedule in AutoCAD 2005 format; though it is not essential that this information is provided as a DWG file, this information is critical in determining structural opening sizes within the framing system. This may come direct from the sub-contract glazing designer, in which case, approved subcontract design drawings are required to finalise opening sizes. Changes to openings due to changes in the glazing design are the most common causes of drawing amendments.

Comment & Return Approval Lead Times

This is critical to planning the design phase and ensuring Status A approval is achieved prior to material procurement and siteworks. For Kingspan Off-Site to plan design works effectively and for you to have confidence in the agreed programme, it is essential that a commitment is made from the architect as to how long they need to comment on and return Kingspan Off-Site design drawings.

Approval Process & Status A, B&C Confirmation

Everyone is familiar with the status approval system, but Kingspan Off-Site has experienced minor variations in the translation and effect of status approval. To help manage expectations, Kingspan requires confirmation of what each comment status means. For example, does Status B mean “incorporate comments, go to Construction and do not re-submit” or does it mean “incorporate comments and re-issue for final approval before going to Construction”?

Kingspan Off-Site also needs to know how the architect wants to receive drawings. Do they want PDF, DWG or hard copies issued and is there an on-line drawing extranet site in use on the project, if so, what is the procedure for posting and getting drawing approvals?

Project Structural Engineer

Wind Load Analysis to BS6399 Part 2

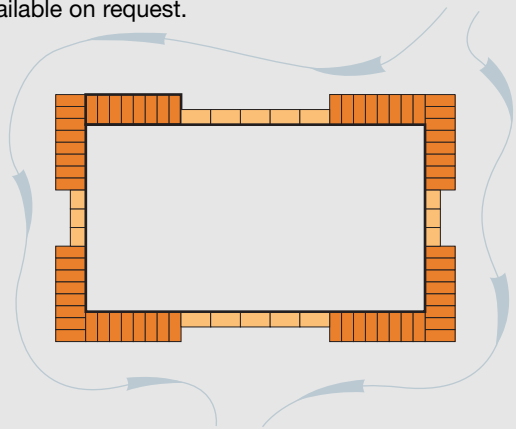
This is the main loading criterion that Kingspan needs to calculate the structural adequacy of the Kingspan SFS

and can have a significant impact on the specification. To undertake structural calculations, Kingspan requires the Project Engineer to submit a detailed wind load assessment stating clearing the surface pressures, by zone and value in kN/m for the cladding elements of the building.

Kingspan has found over the last few years that the terms of service undertaken by the Project Engineers do not include this assessment. Kingspan is able to undertake the assessment on your behalf and can submit calculations for review and approval by the Project Engineer.

Note: the Project Engineer will have done a wind load stability analysis to assess, and prove, the overall performance and adequacy of the main structure against wind forces. This is a wind load assessment, however, it may not be detailed enough to give surface pressure loadings.

Caution: Do not base tenders or design works on an erroneous loading. If you want more information on this subject, Kingspan Off-Site Profiles & Sections has prepared guidance “SFS & Wind Loads” that is available on request.



Structural Engineers Drawings in AutoCAD 2005 format

For Kingspan to accurately assess and draw the building, the information produced by the Project Engineer to set out the primary structure is used. It is therefore important that Kingspan receives this drawn information as a DWG file to avoid duplication of design works and potential misinterpretation of design intent.

Movement & Tolerance Report

Kingspan SFS is designed to accommodate live load deflection from cast concrete and hot rolled steel structures by anticipating the possible vertical movement of elements between vertical columns. This has an impact on the adequacy of track and stud members so Kingspan requires confirmation of the maximum permissible deflection of elements under live loads. This information should be readily available from the Project Engineer.

Main Contractor

Build Programme

This is essential in planning and programming design works to ensure works follow the build sequence. This is required very early on to make sure Kingspan has adequate design resource set aside for your project.

CDM Supervisor

As part of Kingspan's responsibilities under CDM legislation, contact details of the responsible person for CDM are required so that any issues arising from the design of the framing system can be relayed directly to the project team and addressed as required.

Sub Contract Designers

Confirmations of Finishes Weights & Details

As the vast majority of external treatments are now designed by sub-contract companies, Kingspan requires details of these systems to ensure that the stud arrangements are correct and adequate for purpose. To do so, standard details of the finish types and their dead weights per metre need to be supplied so sufficient allowances during calculation can be made.

Confirmation of Deflection Limits

Kingspan SFS is designed to resist deflections experienced by finishes (internal & external) to ensure there is no risk of localised distortion, cracking or peeling of the treatments under high wind loads. This has a significant affect on the calculation of the studs and to make the systems as efficient as possible, confirmation is required from the plasterboard and finishes manufacturer of their permissible deflection limits. This value is the maximum amount of deflection allowed within their particular product before distortion takes place. Kingspan will ensure the systems are designed to suit the specific wall build up.

Installation Sub Contractors & Clients

Scope of Works

The most common cause of frustration on construction projects can be derived from unclear or unspecific scope of works confirmation. To avoid this frustration, Kingspan's Sales team will review the design of the project to ensure that all areas of the framing design and supply are covered in the fee proposals to you. This significantly reduces the risk of change control events and gives a clear structure to the project, defining Kingspan's responsibilities to you and consequently your responsibilities to your client.

Design Service

Basic Design Service

Kingspan Off-Site's Design Team offers its clients peace of mind by ensuring the project has an engineered solution that has been designed by leading industry professionals. When you choose to procure your material through Kingspan Off-Site, the team helps to ensure the structural scheme for Kingspan SFS is the most efficient and robust, leaving you to get on with the installation.

With Kingspan's Basic Design Service, a review is conducted of the Architects and Structural Engineers drawings to find the most commonly repeated detail across the project. Kingspan then undertake detailed structural calculations and provide elevation and detailed drawings based upon the condition identified. Following is a breakdown of what you can expect to receive from Kingspan's basic design service.

Structural Calculations

Kingspan Off-Site will provide detailed calculations to BS5950 to cover the following engineering issues:

Stud & Track Design - Kingspan will determine the specification of the studs, their spacing, your preferred head construction and adequacy of the head and base tracks in a brief and clear report.

Fixing Design - depending on what type of fixing is best suited to the condition and your installation preferences, Kingspan will examine and specify the fixing types and frequency on the conditions identified as most common.

Kingspan Off-Site's Design Team offers its clients peace of mind by ensuring the project has an engineered solution that has been designed by leading industry professionals





Basic Drawing Information

What Kingspan Off-Site needs from you

There may only be a handful of different window sizes on the project, in which case Kingspan will look at the two most common window types and provide a typical bay drawing. This will show the opening sizes, the tolerances around such openings and the Kingspan SFS construction that is required for them. Kingspan will also give a section detail through the head and base of the system specifying fixings and basic setting out information, if applicable.

To help provide you with an efficient service, Kingspan is to be provided with the following information before design work can begin:

- 1 Architects drawings in DWG format
- 2 Structural Engineers drawings in DWG format
- 3 Wind Loadings to BS 6399 Part 2
- 4 Maximum live load deflection value
- 5 Preferred head and base track fixing

How long does Kingspan need?

Kingspan Off-Site Profiles & Sections endeavours to provide basic information within one week of receipt of full and final information. Kingspan is sympathetic to special cases where time is of the essence. Please contact Kingspan Off-Site's Design Manager to discuss the project.

Design Service

Detailed Design Service

The Technical Team at Kingspan Off-Site Profiles & Sections is made up of committed professionals dedicated to providing a level of engineering and project support unparalleled in the steel framing section marketplace.

With a long and successful track record of providing framing section solutions, Kingspan Off-Site Profiles & Sections has developed its skill range and technical knowledge to make sure that the specification, procurement and supply of sections is the simplest part of the project.

How the Service Works

Kingspan Off-Site Profiles & Sections considers every aspect of the project when undertaking full design and for that reason, every project is assessed on its own merits so the most efficient and cost effective solution can be specified.

Full Drawing Information

Kingspan Off-Site Profiles & Sections provides detailed section and elevation drawings for the areas of Kingspan SFS on the project so there is no doubt what the framing sections construction is for any given part of the building.



Kingspan also ensures that its drawings are passed through the relevant approval procedures so that installation proceeds with the assurance that it has been approved by the project Architect, and is available for submission to the client as part of the CDM and O&M requirements.

Project Management Support

Kingspan Off-Site understands that you cannot accurately estimate cost for every possibility on a project and that programmes can vary due to the sometimes unpredictable nature of site. Kingspan Off-Site is your representative in the design decision making process and will always serve your interests to prevent cost and the programme from over-running. Kingspan Off-Site Profiles & Sections has gained significant experience whilst working on some of the country's largest and most prestigious construction projects.

Detailed Structural Calculations

Kingspan Off-Site Profiles & Sections provides detailed calculations to BS5950 and ensures that every component of the Kingspan SFS system and its relative parts have been designed and checked by a qualified engineer. Kingspan Off-Site provides these calculations for inclusion in the O&M Manual published early in the project so that the engineering of the framing sections can be undertaken in an effective and open manner with other involved parties, such as glazing and steelwork contractors.

The calculations will cover all aspects of the Kingspan SFS construction, unless by specific exclusion.

Kingspan Off-Site Profiles & Sections provides concise and comprehensive technical information for;

- 1 Stud and track - design and specification
- 2 Structural opening - design and specification
- 3 Fixing - design and specification
- 4 Bracket and cleat - design and specification
- 5 Your preferred head and base track fixings

Detail Design Service - how does it work?

As early as is possible in the project contact Kingspan Off-Site Profiles & Sections. The sooner Kingspan know your requirements, the sooner work can begin.



What is needed from you?

In order to provide an efficient service, Kingspan needs to be provided with the following information before design-work can begin;

- 1 Architects drawings in DWG format
- 2 Structural Engineers drawings in DWG format
- 3 Wind Loadings to BS6399 Part 2
- 4 Maximum live load deflection value
- 5 Your preferred head and base track fixings

What will it cost?

Kingspan Off-Site Profiles & Sections generally charges a flat rate per square metre gross over gross area of the framing section for simple projects - this is agreed in advance. Kingspan might make specific exclusions from this flat rate depending on the complexity of the engineering. If this applies to your project, Kingspan will discuss the matter with you.

How long will it take?

Every project varies in its size, complexity and programme. Kingspan agrees a programme in partnership with you so that there is adequate design time and to allow the architect sufficient time to review and approve. This also provides clarity as to when the procurement cycle can begin and when you can start on site.

What's the process?

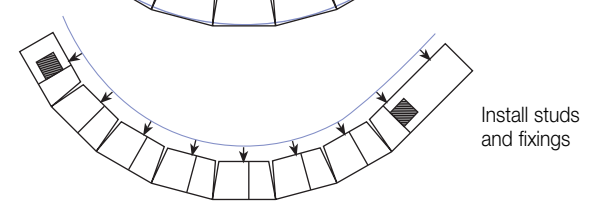
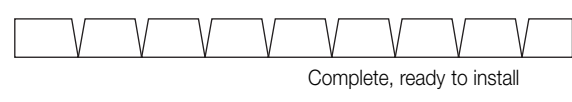
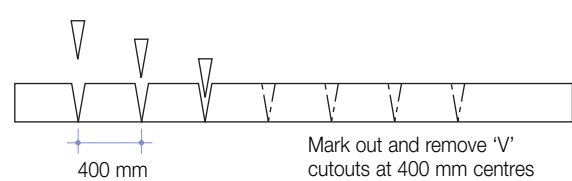
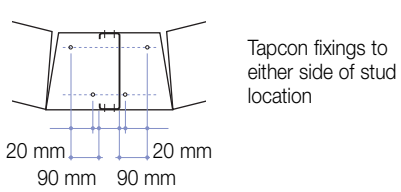
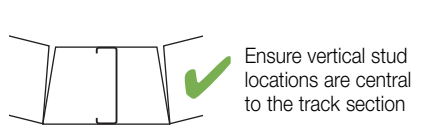
Once Kingspan Off-Site Profiles & Sections has received the required information and fees and programme agreed, the preliminary design cycle can begin by releasing initial drawings and RFI's where detail is unclear or not freely available. The Architect then has his first opportunity to comment on the design works. Once the architect's approval has been received the project progresses to construction status, from which material procurement can begin.

Construction Details

Infill Standard Construction Details



Constructing a Curved Profile





Construction Details

Oversail Standard Construction Details







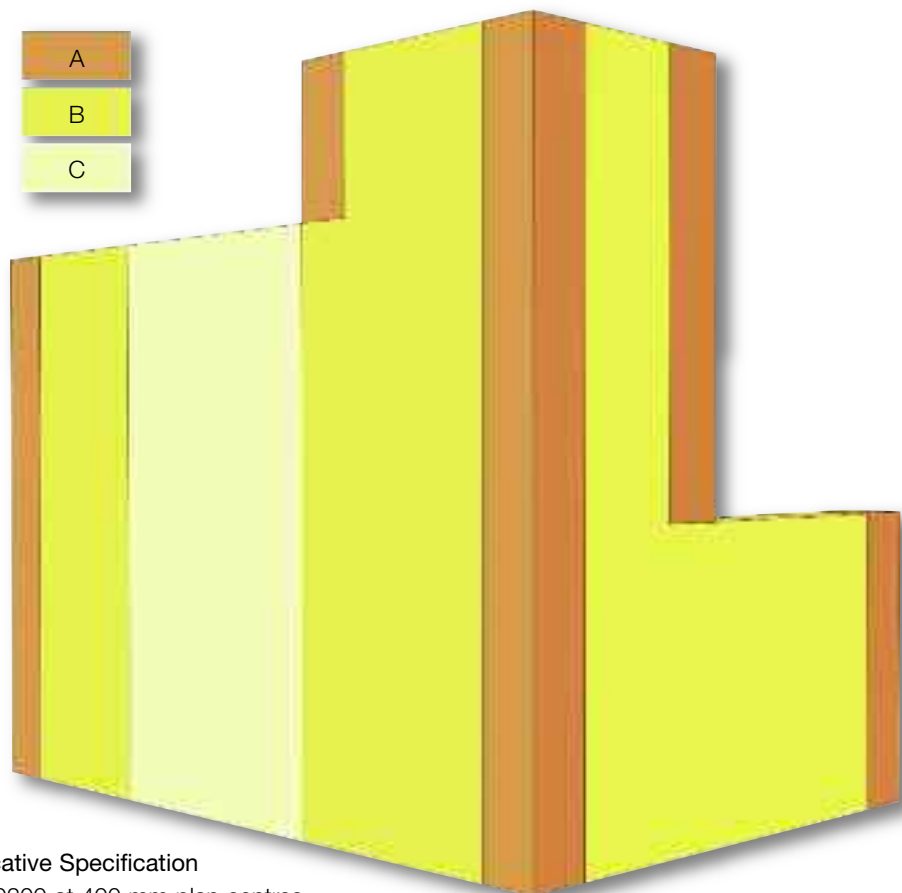
Guidance Notes

Structural Performance

Wind loading is the main force to be considered when designing an external façade / wall solution with Kingspan Steel Framing System (SFS). Wind loading can greatly affect the design and cost of the system and should be examined as a critical performance criterion at the beginning of the project. For this reason following is a short guide to why and how to maximise the efficiency of Kingspan SFS.

The temptation at the beginning of a project is to assume a worst case wind load that can be applied to the whole building and though this may speed the immediate tendering and costing process, it invariably leads to over-engineering of the Kingspan SFS and unnecessary cost.

Fig 1.1 Basic Wind Zone Areas

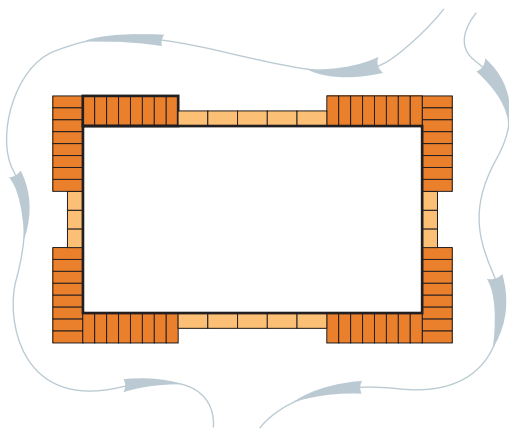


Zone Indicative Specification

- A C100070200 at 400 mm plan centres
- B C100070120 at 600 mm plan centres
- C C100050120 at 600 mm plan centres



Fig 1.2 Wind Movement



The main reason for this is that the highest wind load experienced on a building is normally imposed at the corners where the wind pressure and suction are at their

greatest. If this is taken as worst case, the main sections of the elevation that experience less load have been designed for an unrealistic and excessively high load.

The lower loaded areas may then be divided into smaller sections as the load reduces along the elevation as shown in Figure 1.1 and Fig 1.2. The area marked as Zone A will experience the higher loads (2.0 kNm² for example) and Zones B and C reducing loads (1.5 kNm² & 1.0 kNm²);

The savings to be had by confirming accurate wind loads is obvious once the specification has been calculated. This saving increases when considering special construction types around openings.

Consider the example of a typical opening of 1.75 m x 1.0 m over a vertical span of 2.6 m under Zone A & C wind loads, we can see the differences in construction for the jamb and head / cill immediately.

Construction	Zone A-2.0kNm ²	Zone C -1.0kNm ²	Saving
Jamb	C100070200+U104068200	C100070120	37% cost saving
Head & Cill	U104068200	U104055120	48% cost saving

All saving information is based upon list price between the two zone constructions. Savings may vary and should be checked with Kingspan Off-Site's Sales Team.

Defining whole building wind loads in this manner can be conservative as it only takes into account the effects of the wind in plan and generalises the loads according to the height of the structure. However, high buildings experience more wind load at the top of the building than at ground floor. A more detailed analysis can be

undertaken that can identify any increase or decrease in load between floor levels and specific architectural details (projecting fins and parapets for example).

For more detailed guidance notes contact Kingspan Off-Site Profiles & Sections (see rear cover).

Guidance Notes

Structural Performance

Deflection and the movement of the structural frame relative to the cladding elements are a reality on all construction projects. Whether the primary structure is in-situ concrete or hot rolled steel, live load deflection must be accommodated to prevent internal and external finishes distorting or becoming damaged during the buildings use. The stiffness of the slab / floor structure has a direct bearing on its ability to resist movement whilst under load. In most structures, this load takes the form of a downward movement (in this instance at slab edge to an external wall) and can normally be calculated using the span 360 formula in accordance with BS5950, though this should always be checked by the Project Engineer and incorporated into the engineering specification. Span is taken as being the maximum distance between vertical structural elements as shown below:

This is then the maximum deflection that can be experienced at the slab edge and the greatest deflection is obviously mid-span (on a simply supported bay, not a cantilevered system).

Span = 7.0 m between columns, therefore $7000 \text{ mm} \div 360 = 19.44 \text{ mm}$.

Kingspan SFS accommodates this movement at the head of the panel using a 'deflection head' track which has a longer leg and is made from a thicker gauge steel than the base track. Fig 1.2 shows a typical deflection detail using head track which is most commonly used in 'Infill' conditions. Figure 1.3 shows a typical deflection detail using a slotted cleat which is generally used in an oversail condition. The value is determined by the span 360 formula and then allowing a further 5 mm construction tolerance to take into account any casting or installation deviations in the slab. This then gives a working head tolerance that can be specified either across the entire project or specific to an area. The designer should consider the affect on the performance of the track. The greater the distance at the head of the stud, the less bearing the stud has on the head track.

This significantly reduces the capacity of the head track to resist loads so wherever possible, ensure the deflection limit is restricted to a maximum of 20 mm.

Deflection is accommodated in a different way for 'Oversail' systems. Kingspan Off-Site Profiles & Sections recommends that the dead load of the external wall be carried either directly into the foundation or into the main structure by using a shelf angle on a particular floor slab. The example shown in Figure 1.4 shows the wall being supported by brackets from a slab edge and Figure 1.3 shows the wall being restrained by slotted brackets at each intermediate floor. The advantages for using this kind of system is the entire wall is separated from the movement of the primary structure.

Fig 1.2 Deflection in an 'Infill' condition

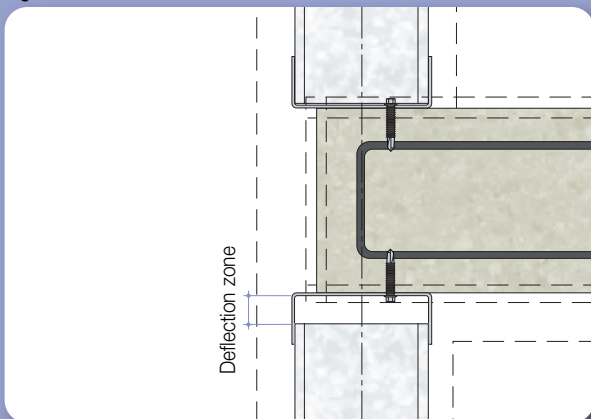
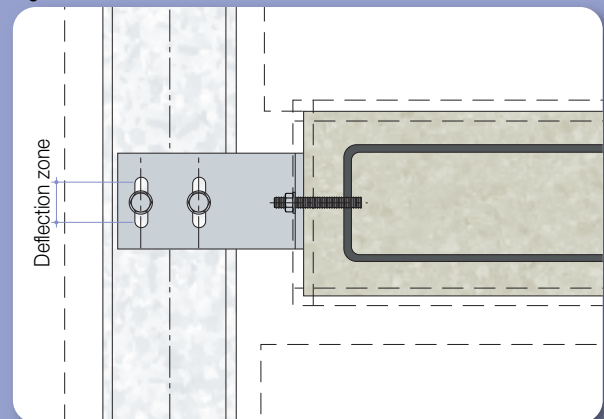


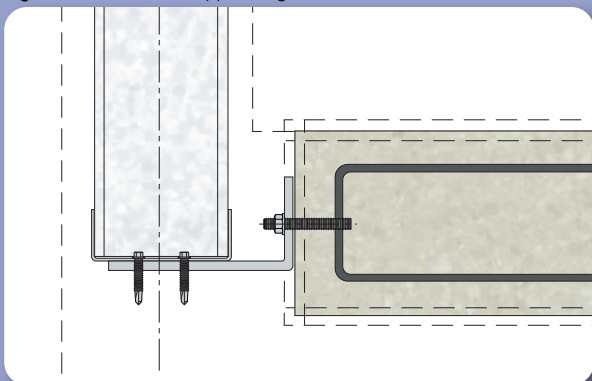
Fig 1.3 Deflection at intermediate floor for "Oversail condition"





Deflection and the movement of the structural frame relative to the cladding elements are a reality on all construction projects

Fig 1.4 Oversail base support angle



However, the bracket and fixing design have to be carefully designed and calculated to coordinate with the reinforcement of the concrete and any special conditions of the main structure. For this reason, it is advised that the opinion of the project engineer be sought.

The slab is free to move up and down without disturbing the façade. This is of particular benefit when the designer wants to minimise visible expansion joints or wants to use a tiled or panelled finish that does not coincide with the movement of the floor slabs. Kingspan Off-Site's engineers have a wealth of experience in the design of these types of systems and will be only too happy to assist with any technical questions.

Guidance Notes

Light gauge steel constructions require a warm frame construction to meet Building Regulations and maintain the integrity and serviceability of the wall build-up.

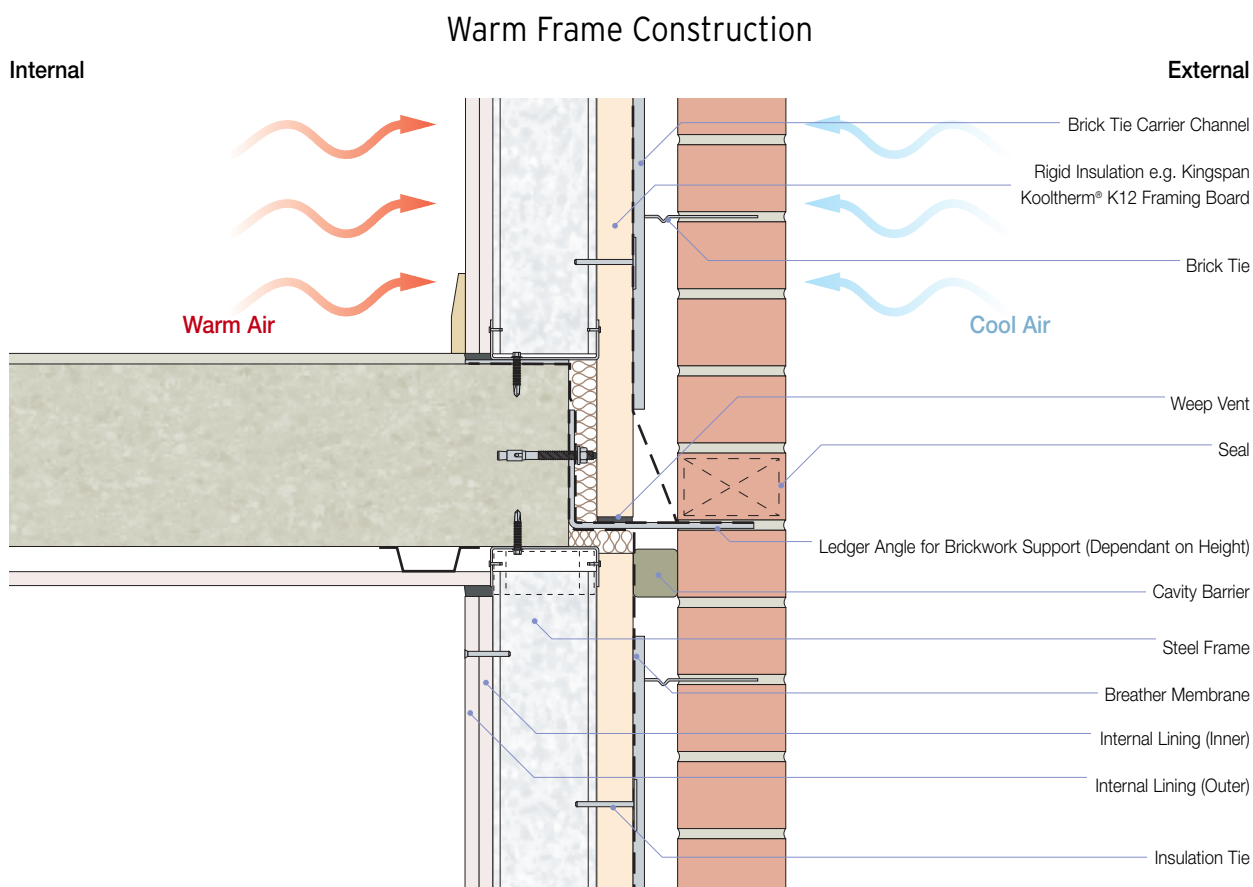
Thermal Performance

Warm Frame Construction

Within a warm frame construction the outer face of the light gauge steel frame is typically sheathed and insulated with a suitable rigid insulation board e.g. Kingspan Kooltherm® K12 Framing Board.

By placing the insulation on the outside of the frame, thermal bridging of the steel elements is virtually eliminated, thereby minimising the risk of

condensation occurring on the internal face and avoiding pattern staining on the face of the plasterboard. The insulation can also be brought right up to the window and door frames ensuring continuation of the insulation at these potential thermal bridging points. The temperature of the frame is also maintained above the dew point, which prevents interstitial condensation within the frame. Air-tightness can either be achieved by taping and sealing the joints of foil faced rigid insulation boards, or by sealing the internal plasterboard to form an effective air barrier, or by using a membrane integrated within the construction.



Inter-Stud Insulation

Inter-stud insulation can be fitted where low U-values are required below 0.25 W/m²·K. Rigid insulation boards are fixed directly to the frame and mineral wool is placed between the vertical studs. It is recommended that no more than two thirds of the total U-value is provided by the inter-stud insulation to minimise cold bridging. The mineral wool should be packed tightly and be held against the rigid insulation board. The air barrier and vapour control layers are normally formed by the internal lining, which would include two layers of plasterboard, one being vapour

resistant (by an internal foil layer) and the other being fire resistant to achieve 60 minutes fire resistance. Alternatively, a vapour control layer may be used, in which case, the internal board can be standard plasterboard. Care should be taken to ensure that the inter-stud insulation is maintained above the dew point temperature.

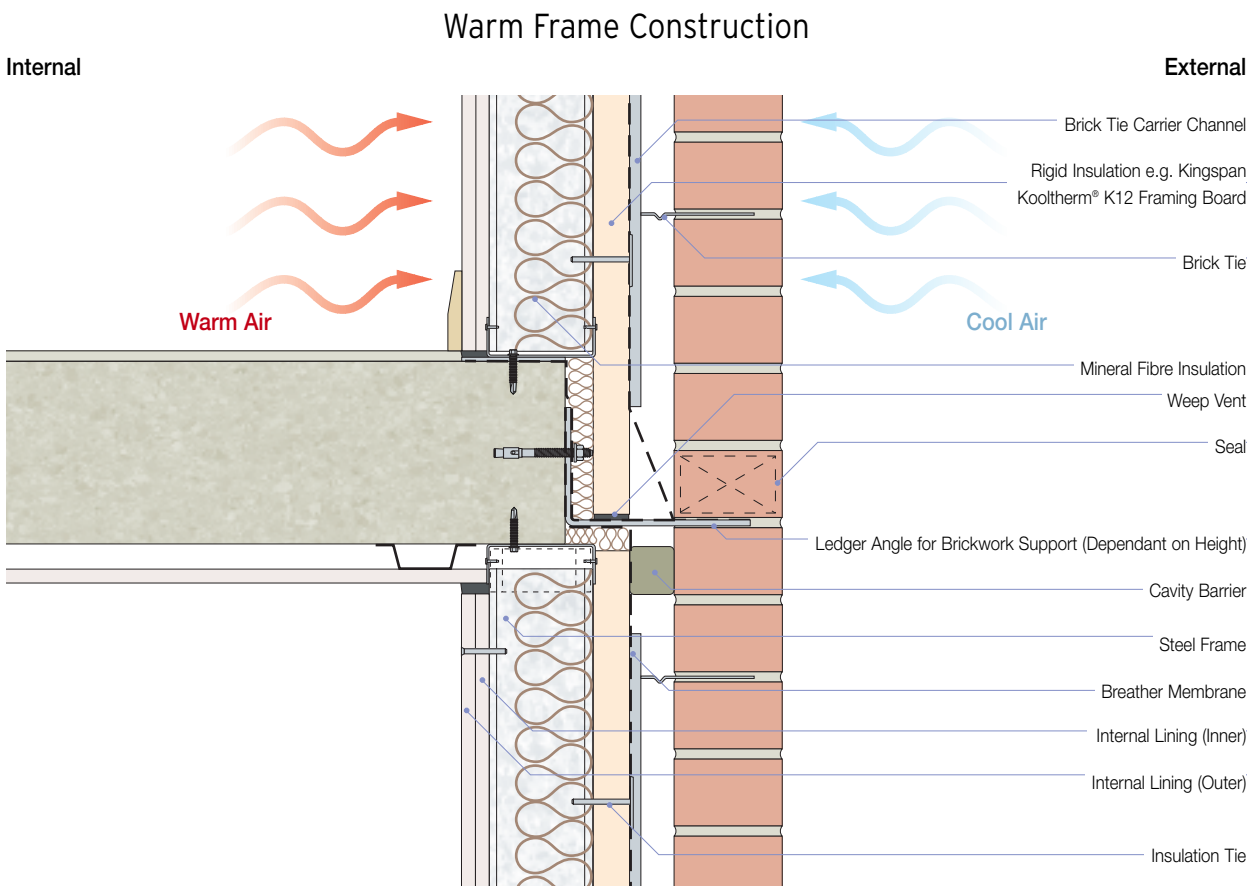
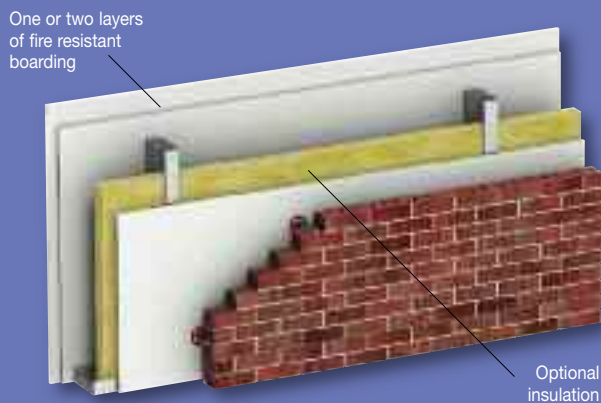


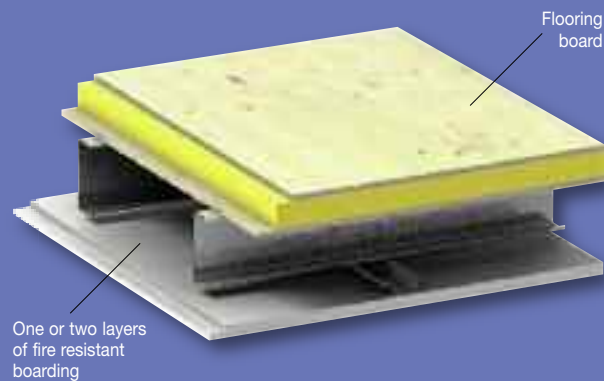
Diagram: Warm Frame Construction Internal and

Guidance Notes

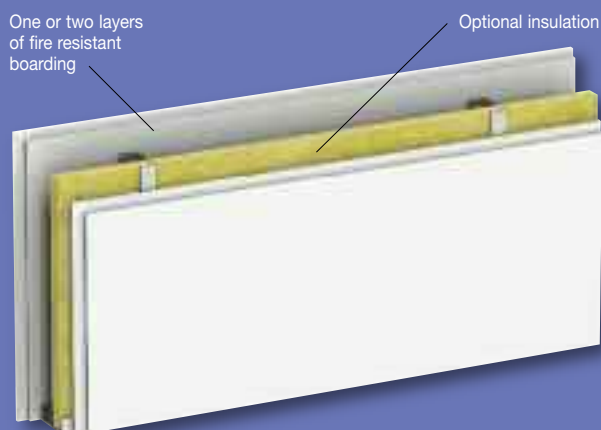
External Wall Partition



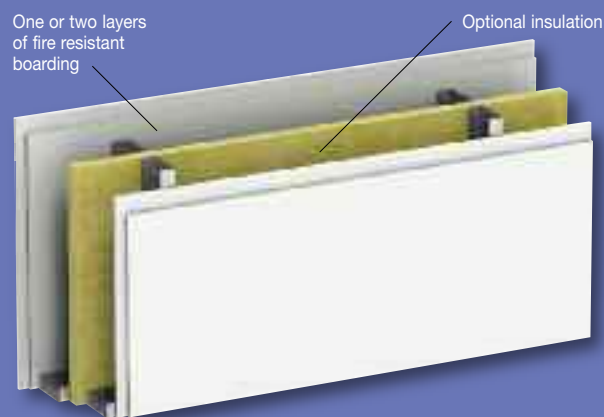
Intermediate Floor



Internal Partition Wall



Compartment Wall



Fire Protection

There are three main methods of protecting hot & cold formed steel sections. These are broadly defined below:

Method 1. Planar or flat protection: This is usually in the form of a single or multiple layer of fire protecting boards e.g. Lafarge Firecheck.

Method 2. Board Protection to columns or beams: This is usually achieved using a “box” sealed around the section using plasterboard or specialist materials.

Method 3. Sprayed protection: This is sprayed around columns or beams directly applied to surface of the section/s.

The thickness of fire protection is determined by the required exposure conditions, and its requirement is therefore to limit heat entering the steel section.

Depending on the use of the steel section heat may enter from all sides as in column or beam construction, or from one side as in walls acting as compartment boundaries. Typically methods 2 & 3 described above are applied to hot-rolled columns or beams, but this type of protection can be used for heavier gauge cold-formed sections when used as structural beams or columns.

Method 1-Planar Protection and Cold Formed Sections

Method 1 describes the use of boarding to act as protective fire resistance. There are many forms of planar protection that offer fire resistance to steel sections used in walls or floor joists. It is recommended you consult a boarding specialist with detailed

knowledge of fire protection for specific project advice, as the information contained within this document is for general guidance only. It is worth mentioning that there is a relationship between the construction of floors and walls for both fire resistance and acoustic attenuation requirements and that these should be designed together. For guidance on acoustic attenuation please see the Kingspan Off-Site guidance note SFS & Acoustic Attenuation.

Planar Protection to Walls and Floors

Wall and floors within buildings often comprise of stud walls and floor joists at close proximity plan centres. Typically the walls and ceilings are covered in an internal lining board that is appropriate to resist fire. These can be fixed directly to the steel or supported from furrings, resilient bars or other secondary members.

In most conditions this type of planar protection is treated as being subject to fire from one side, in order to contain a fire within a compartment. Typically one layer of internal lining board may provide fire resistance of up to 30 minutes;

multiple layers of boarding or specialist boards may be required to achieve a greater fire resistance. Instances

that require load-bearing walls that are subject to fire to both or all sides, require furthermore detailed assessment.

The joints between individual walls or between walls and floors provide a route for fire or passage of heat. These should be jointed properly to minimise this route and in some instances two layers of boarding are specified to achieve robustness of design and prevent poor installation or deterioration over time. Alternatively there are fire protection boards that are specially designed to provide better strength and resistance to shrinkage. In addition to this the use of cavity barriers should also be used to contain and prevent the spread of fire within a building.

The table below provides guidance on fire resistance for typical walls, floors and partitions comprising of cold-rolled components and planar board protection, heated from one side only. This information should be assessed on a project specific basis and the user should satisfy themselves that this guidance is not applied without further assessment and justification from a specialist advisor or system manufacturer.

Form of Construction	Layers of Board	Protection	Fire Resistance in minutes		Notes
			Plasterboard	Fire Resistance Board	
Floors with Ceiling Protection	1	12.5	-	30	-
	2	12.5	30	60	+60 mm Glass Wool Mat**
	2	15.0	-	90	-
Non-Load-bearing Walls (partitions)	1	12.5	30	30	-
	1	12.5	30	60	+25 mm Glass Wool Mat**
	1	15.0	30	60	-
	2	12.5	60	90	-
	2	12.5	60	120	Section depth
	2	15.0	90	120	<60
Load-bearing Walls	1	12.5	-	30	-
	2	12.5	30	60	-
	2	15.0	-	90	-
Load-bearing Walls	1	12.5	-	30	-
	2	12.5	30	60	-
	2	15.0	-	90	-

* Glass insulation wool mat for insulation purposes for more than 30 minutes fire resistance

** for floors: the glass wool insulation mat is only necessary for fire resistant suspended ceiling

For further information and guidance notes on Fire protection contact Kingspan Off-Site Profiles & Sections

Guidance Notes

Acoustic Performance

The performance of acoustics in floors and walls is an important consideration within many buildings.

Requirements of design are set out in Building Regulations Approved Document E. There are several ways of achieving compliance. It must be stressed that Approved Document E is a guidance document only. Other authoritative guidance documents provided by professional bodies such as the NHBC and the Steel Construction Institute are available.

Kingspan Off-Site stud walls are manufactured using lightweight cold formed steel sections and are very common within commercial, education, healthcare and residential developments. The illustrations show some of the construction systems that Kingspan Off-Site recommends forming walling within different buildings.

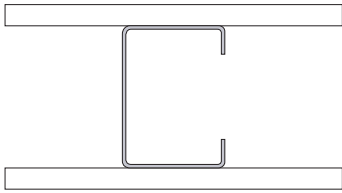


Requirements of design are set out in Building Regulations Approved Document E



Basic Internal Partitions

Typical internal walling consists of plasterboard applied to either side of the Kingspan Off-Site internal stud framing.



Construction A:

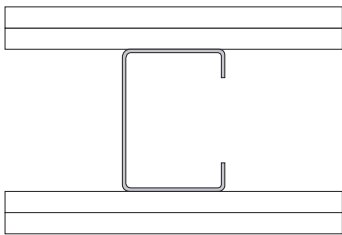
Kingspan Off-Site stud with one layer of plasterboard each side.

Airborne sound insulation is typically in the range of 37 – 46 Rw.

Note: Specific values will depend on products used.

Internal Partitions /Compartment Walls with Enhanced Acoustic Insulation

Enhanced internal compartment / partition walls usually require 2 layers of plasterboard either side of the Kingspan Off-Site steel stud frame. Kingspan Off-Site studs can vary from 70 to 100 mm depending on structural requirements for the system, mineral wool may be added to the internal system to improve sound insulation further.



Construction B

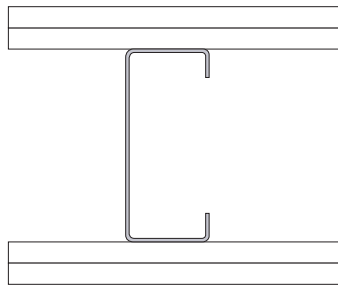
Kingspan Off-Site stud with two layers of plasterboard each side.

Airborne sound insulation is typically in the range of 46 – 54 Rw.

Note: Specific values will depend on products used.

Internal Partitions / Compartment Walls with Enhanced Acoustic Insulation

Enhanced internal compartment / partition walls usually require 2 layers of plasterboard either side of the Kingspan Off-Site steel stud frame. Kingspan Off-Site studs can vary from 100 to 150 mm depending on structural requirements for the system, mineral wool may be added to the internal system to improve sound insulation further. Generally if the depth of the stud increases, greater sound insulation is achieved.



Construction C

Kingspan Off-Site stud with two layers of plasterboard each side using a deeper Kingspan Off-Site stud.

Airborne sound insulation is typically in the range of 50 – 58 Rw.

Note: Specific values will depend on products used.

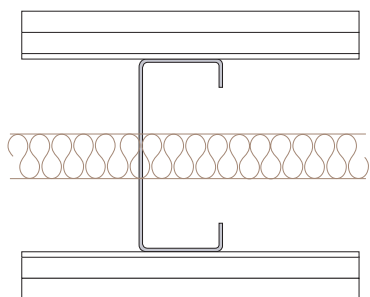


Guidance Notes

Acoustic Performance

Single Partitions with Enhanced Acoustic Insulation

Enhanced internal compartment / partition walls usually require 2 layers of plasterboard either side of the Kingspan Off-Site steel stud frame. Kingspan Off-Site studs can vary from 100 to 150 mm depending on structural requirements for the system, mineral wool may be added to the internal system to improve sound insulation further. Resilient bars are used to further increase acoustic attenuation. Generally if the depth of the stud increases, greater sound insulation is achieved.



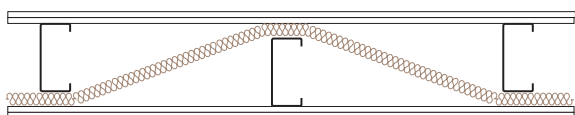
Construction D

Kingspan Off-Site stud with two layers of plasterboard each side using a deeper Kingspan Off-Site stud. Airborne sound insulation is typically in the range of 53 – 60 Rw.

Note: Specific values will depend on products used.

Internal Staggered Kingspan Off-Site Stud Partitions / Compartment Walls

Enhanced internal compartment / partition walls usually require 2 layers of plasterboard either side of the Kingspan Off-Site steel stud frame. The Kingspan Off-Site studs are staggered and mineral wool passed between the off set studs. Generally if the depth of the stud increases, greater sound insulation is achieved. This installation provides higher levels of sound insulation with a single line layer of stud walling.



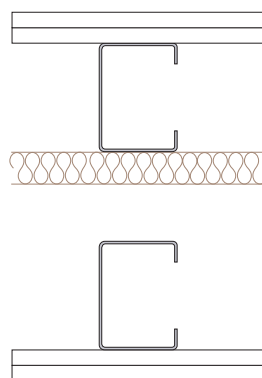
Construction E

Kingspan Off-Site stud with two layers of plasterboard each side using a deeper Kingspan Off-Site stud with staggered stud partitions. Airborne sound insulation is typically in the range of 49 – 68 Rw.

Note: Specific values will depend on products used.

Internal Partitions / Compartment Walls on Double Independent Framework

Double layer internal partitions comprise two independent stud frames each of which carry one face. The additional isolation means greater sound insulation can be achieved. Sound insulation can be achieved by increasing layers of boarding or by introducing mineral wool mat.



Construction F

Twin Kingspan Off-Site stud with two layers of plasterboard each side with a quilt within the cavity. Airborne sound insulation is typically in the range of 56 – 64 Rw.

Note: Specific values will depend on products used.

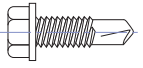

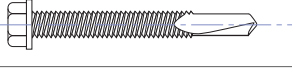

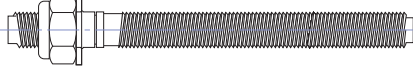

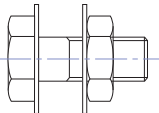
The performance of acoustics in walls is an important consideration in many buildings



in floors and
ion within

Fixings and Accessories

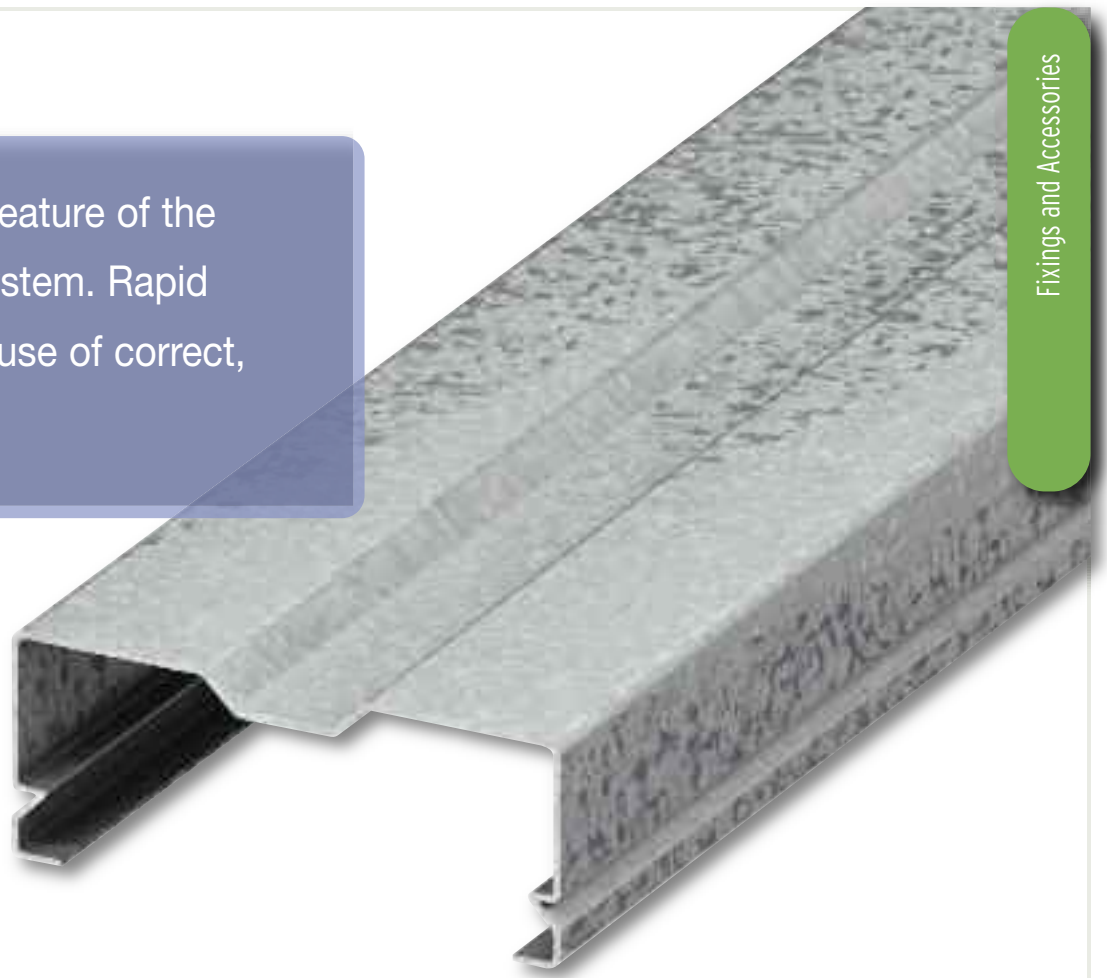


Recommended Fixings		
Application of LGS Connections	Fixing Arrangement	Fixing
SFS Stud to Track (Standard)	Hex Head Light Duty Self Drilling Tek Screw	
SFS Stud to Track (Low Profile)	Wafer Head Light Duty Self Drilling Tek Screw	
SFS to Structural Steelwork	Hex Head Heavy Duty Self Drilling Tek Screw	
SFS to Structural Concrete	Safety Stud Anchor Screw	
Cleats / angles to Structural Concrete	Chemical Anchor Bolt	
External Carrier Board to LGS	Countersunk Self Drilling Twin Tipped Tek Screw	
SFS to Large Section Bracketry	Grade 8.8 BZP Bolt Set (complete with locking nut and washers)	

All fixings must be installed according to the manufacturers instructions.



Rapid assembly is a key feature of the Kingspan Off-Site SFS System. Rapid assembly is aided by the use of correct, high quality fasteners



Fixings

Rapid assembly is a key feature of the Kingspan Off-Site SFS System. Rapid assembly is aided by the use of correct, high quality fasteners. Kingspan Off-Site recommends the use of high quality self drilling screws with appropriate corrosion resisting coatings compatible with galvanized steel sections.

When connecting steel components together, a hex head or wafer head screw should be used. When connecting lining boards or insulation boards, a countersunk head fixing is preferable.

The table shows the appropriate generic fasteners for a variety of connection types typically encountered in steel framing installation. Drawings and recommendations are indicative only and the specifier or installer should verify the precise fixings to be used on a project specific basis.

For specific technical queries, please contact the Kingspan Off-Site SFS technical support team on 01922 724 789.

Notes: All drawings shown are indicative and for illustration purposes only.

Where bi-metallic corrosion may occur, Kingspan Off-Site Projects recommend the use of neoprene, Mylar or equal approved other isolation sleeves and washers.

Cut edges of SFS should be coated with a suitable paint or lacquer to prevent corrosion of the exposed steel.

Additional Kingspan Off-Site Products

Kingspan Off-Site Profiles & Sections has developed a dedicated capability to supply customised products to the building construction industry.

The supply into this market draws on the key strengths of reliable service and product development. The main products are listed below:

Mezzanine Floor

Mezzanine systems and housing floor joists utilising Kingspan Off-Site's Sigma Beam range. Kingspan Off-Site has developed the Sigma Mezzanine floor beam in conjunction with the University of Cambridge which offers unrivalled load bearing for spans up to 7 m, providing cost saving opportunities removing hot rolled sections and reducing the number of cleats required.

Partition and Drywall Components

Industry-leading acoustic and thermal performance with reduced costs. Developed with one of Europe's leading Plasterboard manufacturers Kingspan Off-Site has designed a range of stud and track solutions which include an acoustic system which offers high acoustic performance suitable for the increasingly stringent standards.

Customised Building Components

Efficient and reliable steel sections developed for a range of customers, Kingspan Off-Site manufactures a wide range of building components from steel sections to roofing straps to suit diverse customer requirements.



Kingspan Off-Site

Manor Works, Pleck Road, Walsall WS2 9ES

Telephone: +44 (0) 1922 724 789 Fax: +44 (0) 1922 644 460 Email: sales@kingspanoffsite.com

www.kingspanoffsite.com

SIGMA06.07B



This brochure is printed on paper made from 80% post-consumer waste and 20% virgin pulp which is Forest Stewardship Council (FSC) certified.