EOS

etex building performance
30YEAR*
WARRANTY

# PIONEERING A NEW APPROACH

Delivering Certified and Predictable Performance in One Unitised Solution

## PRE-ASSEMBLED FRAMES

Fire resistant light steel frame infill panel systems

www.eosframing.co.uk

etex inspiring ways of living

EOS

# PIONEERING
# **A NEW APPROACH**

Specialising in advanced light steel framing technologies, our mandate is to challenge the norm and take the construction industry forward by pioneering a new certified systems approach.

## THRUWALL® - THE NEXT GENERATION

Following the outstanding success of our Thruwall® system which is supplied as a custom-designed offsite manufactured kit of parts, in close collaboration with our Etex Group partners – EOS has taken factory prefabrication and preassembly to another level. Developed and rigorously tested our custom-manufactured Pre-Assembled Frames (PAF) are an evolution of Thruwall® which are delivered to site as a unitised non-loadbearing infill system encapsulating light steel framing and external sheathing.

## 30-YEAR PRODUCT ETEX WARRANTY

Delivering crucial cost and time benefits making programme savings of up to 30%, the PAF system offers 60-minute fire resistance and provides a 30-year product and performance Etex warranty. This revolutionary next generation system increases the speed of build without compromising on safety, quality, or performance – to deliver a faster return on investment.

etex building performance 30YEAR WARRANTY

By offering factory manufactured systems rather than standalone products, we support and empower specifiers to be technically skilled frontrunners in the offsite industry.

etex inspiring ways of living

**Gypsum recycling**

Crucible
The gypsum/metal recycling and circular economy specialists

**Etex Building Performance**

siniat
The plasterboard and dry construction materials specialists

Promat
The passive fire protection and firestopping specialists

FSi
The built-in fire protection system specialists

**Etex Exteriors**

EQUITONE
The fiber cement panel specialists

Eternit
The fibre cement profiled sheeting specialists

CEDRAL
The roofing and cladding solution specialists

**Etex New Ways**

EOS · sigmat
The offsite load bearing and steel frame specialists

Evolusion
The leading MMC engineering consultants

**Etex Industry**

With a UK turnover in excess of £200 million – Etex combines the products, solutions, and expertise of leading lightweight construction brands. Through passion, innovation and adherence to the highest standards, we deliver the very best products and services to our customers and raise the bar in everything we do.

# MITIGATING **RISK**

**The performance of building materials is under an unprecedented spotlight. Architects, designers, specifiers and ultimately, clients – are feeling exposed. Risk, quality, performance, time, and costs need to be assessed and controlled.**

In her report 'Building a Safer Future', Dame Judith Hackitt recommends: "**More effective testing regimes** with **clearer labelling** and **product traceability**, in order to drive **continuous improvement**, **higher performance** and encourage **innovative product** and **system design** under better **quality control**."

## WE HAVE LISTENED – WE HAVE RESPONDED

Current regulations typically deal with individual products and how they perform in laboratory tests. However, we believe material providers should have full-scale testing regimes that study the performance of products working together to see how they interact in 'real' circumstances, like under fire conditions or when exposed to wind and rain.

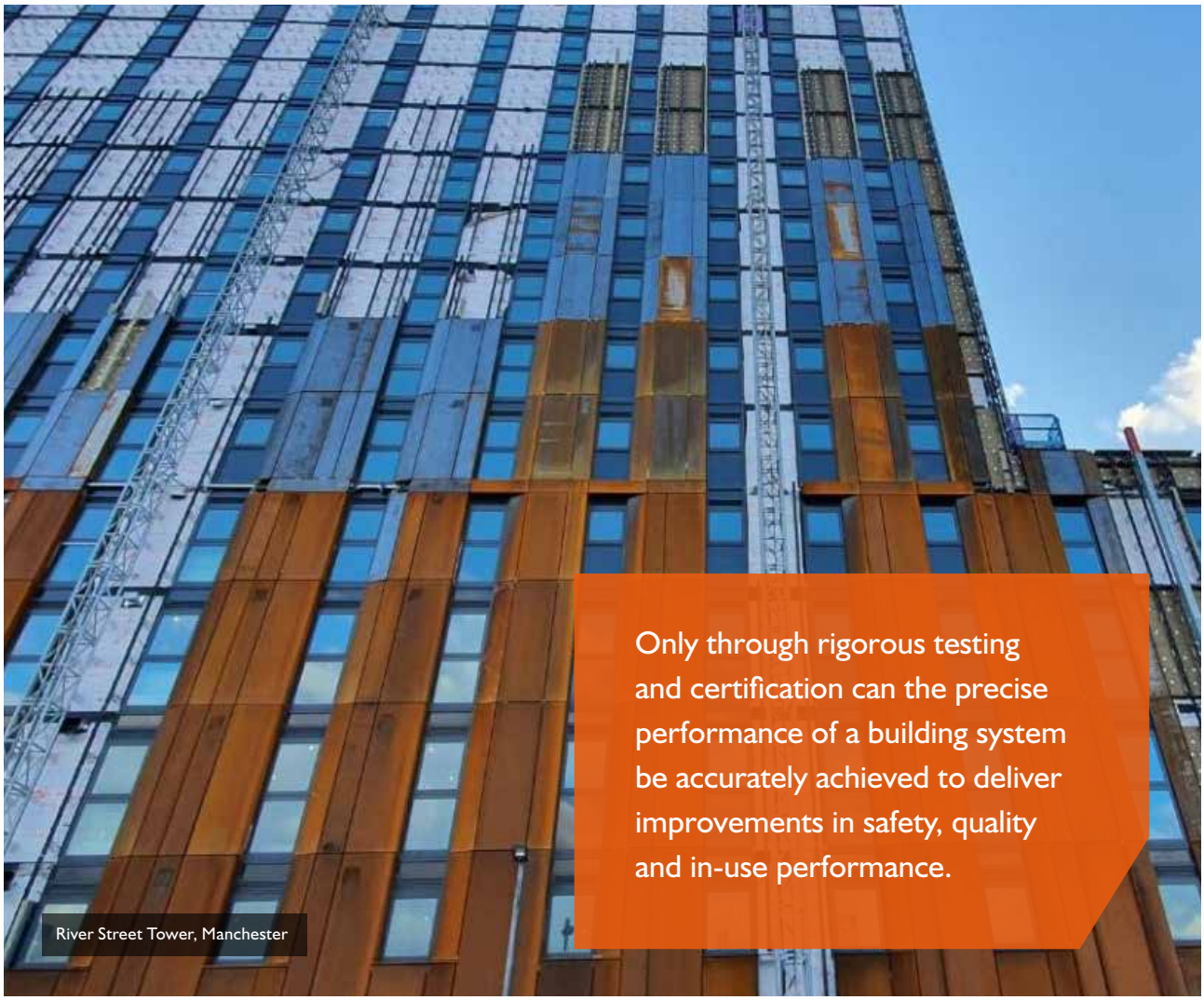
Our research and perspective interviews with sector experts have equipped us with a deep understanding of the challenges faced by specifiers. Lack of performance testing is a major concern. Our Pre-Assembled Frames provide the solution.

Apartments, Baltimore Tower, London E14

# THE **CHALLENGE**

A fragmented supply chain results in components being offered by a multitude of manufacturers, therefore warranties are complex, for very limited timescales or simply non-existent. This uncertainty also extends to the costs involved, the speed of build and the quality of the final outcome.

When disparate building elements are brought together it is left to the specifier to assess whether the chosen combination of materials (boards, metals, insulation) will deliver the required levels of performance. A lack of test evidence and performance data creates real challenges for specifiers having to achieve precise safety and performance requirements.



Only through rigorous testing and certification can the precise performance of a building system be accurately achieved to deliver improvements in safety, quality and in-use performance.

River Street Tower, Manchester

We are committed to technical competence and as part of Etex, we have some of the best building performance experts in the UK on our team. They work closely with certification bodies to jointly develop and design advanced technical solutions.

# THE PAF **SYSTEM**

Etex has three Innovation and Technology Centres where we have our own fire, acoustic, mechanical, structural and thermal testing facilities, equipment and laboratories. We work closely with certification bodies to jointly develop and design technical solutions.

Developed to eliminate uncertainty surrounding the design and specification of the external envelopes – our Pre-Assembled Frames have been created to meet industry demands. Pre-cut, prefabricated and preassembled offsite in controlled factory conditions, these non-loadbearing infill systems are delivered to site as an assembled panelised unit encapsulating EOS light steel framing and external Siniat Weather Defence boarding, ready for glass mineral wool insulation and Siniat internal wall linings to be fitted onsite.

## CERTIFIED PERFORMANCE

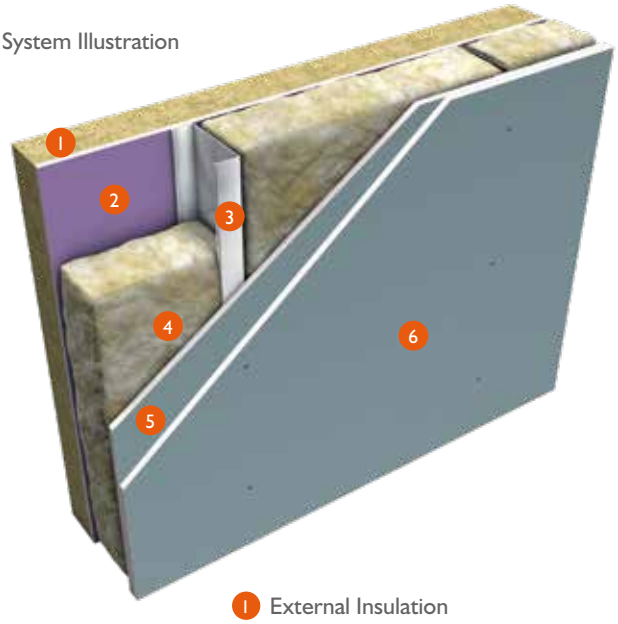
Developed in collaboration with our Etex Group partners, Siniat, a leading expert in plasterboard and drylining, together with fire protection specialists Promat and FSi – this new systems approach combines the technical and manufacturing expertise of the group providing:

- 30-year product and performance Etex warranty
- Fire tested to 60 minutes (integrity and insulation) to EN1364-1 in both directions
- Fire Tested EOS Perimeter Fire Gasket developed for the PAF system
- Fire tested to include real world details such as panel connections, head deflection detail and panel-ends to accommodate site tolerances
- An adaptable solution to meet the architectural brief
- Application as infill panelised systems for steel or concrete mainframes
- The ability to accommodate open spans and full height glazing systems
- Installation from inside the structure, reducing working externally at height
- Reduced mast climber requirements and scaffolding costs

## PAF SYSTEM

**Delivering crucial cost and time benefits making programme savings of up to 30%**

System Illustration




1. External Insulation
2. Siniat Weather Defence Board 12.5mm
3. EOS Steel Framing
4. Glass Mineral Wool Cavity Insulation
5. GTEC dB Board 12.5mm (inner)
6. GTEC dB Board 12.5mm (outer)

# A SYSTEMS **APPROACH**

**Our manufacturer backed system approach helps to design out the complexities surrounding individual components and covers a comprehensive list of performance elements - energy efficiency, acoustics, fire performance, weather resistance and durability. Backed by rigorous testing, our Pre-Assembled Frames get the system performance balance right through the combination of:**

## LIGHT STEEL FRAME

Through a World Class Manufacturing ethos, optimising Design for Manufacture and Assembly principles, EOS operate to Building Information Modelling (BIM) Level 2 standards. Our fully engineered light steel frame systems are custom designed according to the specific project requirements and preassembled under ISO 9001:2015 quality management systems and ISO14001:2015 environmental management standards. The steel framing system selected will depend on the height of the infill wall, the weight of the cladding and the wind load.

## EXTERNAL SHEATHING

With two BBA Certificates, Siniat Weather Defence™ is a revolutionary external sheathing board faced with water repellent material for superior weather protection. Strong, highly moisture resistant and Euroclass A1 fully non-combustible, Weather Defence™ is suitable for buildings over 18 metres and complies with BS EN 15283 Type GM-H1, GM-I and GM-F. Rigid and robust, Weather Defence™ can be left exposed on site for up to 12 months.

## INTERNAL WALL LININGS – SITE APPLIED

Depending on the performance criteria of a project an appropriate Siniat internal wall lining can be selected to provide enhanced levels of sound insulation, fire, moisture, impact or vapour resistance. The minimum requirement is for x2 12.5mm GTEC dB Boards within the PAF system.

## INSULATION – SITE APPLIED

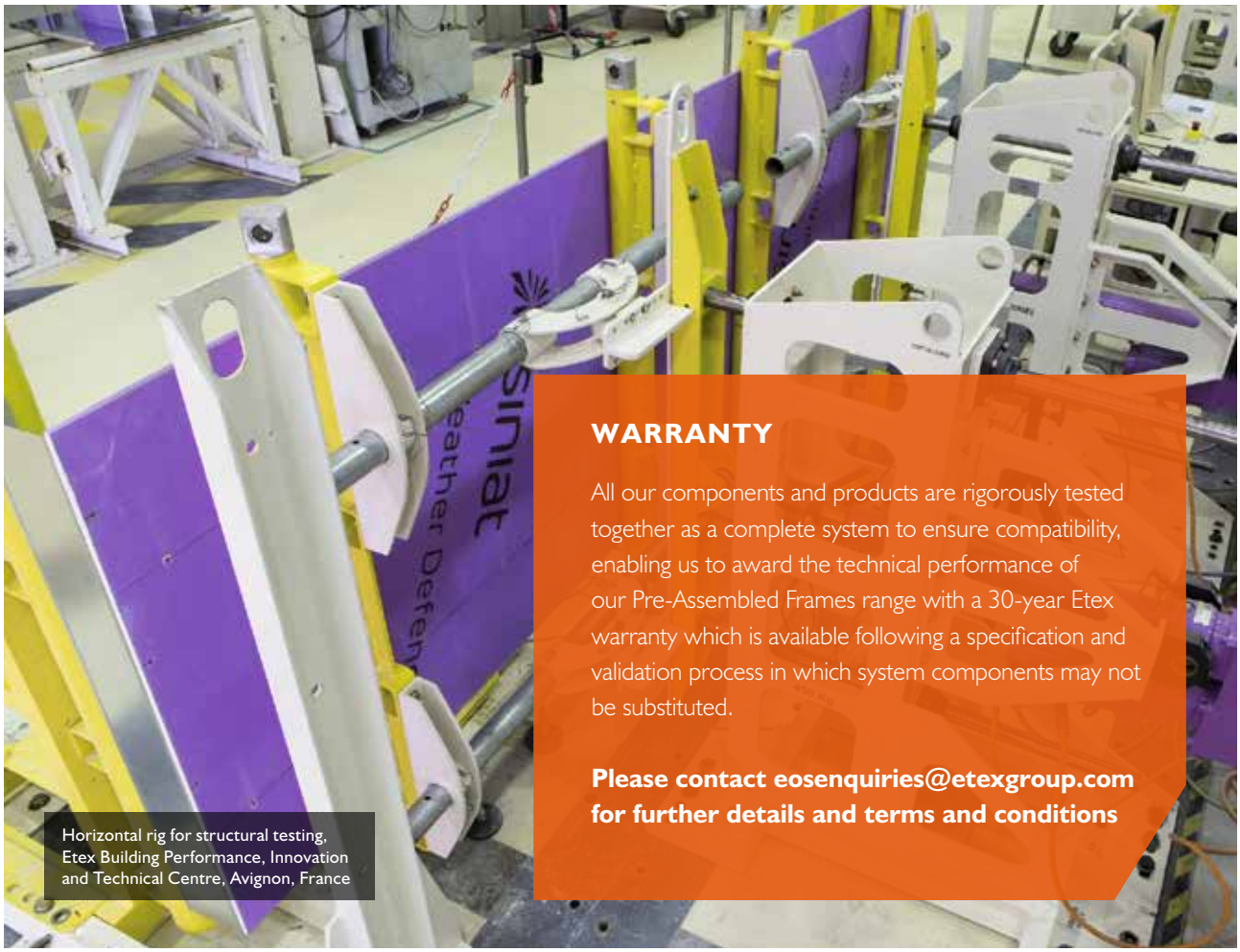
Etex specify the use of glass mineral wool at a minimum thickness of 100mm, λ0.035 or better within the studs of the panel and rock mineral wool within the head deflection detail of the panel.

The PAF Fire Gasket, developed by FSi part of the Etex Group, provides a fire resistant solution to safely close the ends of the panels and deal with building tolerances, where panels meet the primary structure columns.

# TESTING REGIMES **& WARRANTY**

Our products, processes and whole business philosophy show that as a manufacturer EOS take our responsibilities extremely seriously. At the heart of this is rigorous testing, technically competent people and a systems-based approach to our solutions. Our range of technical support is there for specifiers throughout the lifecycle of the project.

Eliminating the 'guess work' – our testing regimes are designed to ensure that our Pre-Assembled Frames give specifiers complete peace of mind knowing that our systems have been subjected to relevant testing for fire, acoustic, weathering, airtightness and mechanical performance.



Horizontal rig for structural testing, Etex Building Performance, Innovation and Technical Centre, Avignon, France

## WARRANTY

All our components and products are rigorously tested together as a complete system to ensure compatibility, enabling us to award the technical performance of our Pre-Assembled Frames range with a 30-year Etex warranty which is available following a specification and validation process in which system components may not be substituted.

**Please contact eosenquiries@etexgroup.com for further details and terms and conditions**

# SYSTEM
# **PERFORMANCE**

**Meeting building performance requirements in a unitised solution, the non-loadbearing infill systems are delivered to site as an assembled panelised unit encapsulating EOS light steel framing and external Siniat Weather Defence, ready for glass mineral wool insulation and Siniat internal wall linings to be fitted onsite.**

## FIRE

The Pre-Assembled Frame system and associated Etex components have been successfully tested for 60 minutes (integrity & insulation) to EN 1364-1 in each direction.

## ACOUSTIC

Systems have been acoustically modelled according to ISO 10140-2 (Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation), ISO 717-1 (Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation) and can provide sound insulation up to 50 Rw dB (45 Rw + Ctr dB) depending on the specified system. Our minimal system can provide 48 Rw dB (40 Rw + Ctr dB), not including external insulation or facade finishes. Systems to enhance acoustics even further are also available if required.

## AIRTIGHTNESS

Approved Document L (Conservation of fuel and power) of the building regulations set out the minimum requirements for airtightness of the external envelope. Siniat Weather Defence is an extremely stable substrate and will only expand by fractions of a millimetre as humidity changes. This means that gaps do not need to be left between the boards. Siniat Weather Defence achieves airtightness of (0.002 $m^3/m^2/hr$) but also that due to the nature of a panelised system, proprietary air sealing tapes are also required to dress the system later in the build process. With a recent project utilising Siniat Weather Defence, an airtightness of less than 1.53/$m^2$ /hr was achieved.


## WEATHERING

Siniat Weather Defence has undergone extensive weathering tests in our purpose-built laboratory. Boards are tested to ensure that they retain their mechanical stability and resist mould growth even when exposed to the elements for extended periods during the construction phase. Weather Defence can be left exposed on site for up to 12 months.

Whilst it is highly resistant to water, the board is also open to vapour, allowing the building to breathe and release potentially damaging moisture trapped within the Pre-Assembled Frame system. These qualities mean that there is no need to install a breather membrane over the sheathing board, saving both time and costs.

Overall airtightness of the external wall will be achieved by the PAF system working in conjunction with proprietary weather/air sealing products, such as EPDM or butyl self-adhesive tapes and an overall good level of workmanship during installation of all components.

## STRUCTURE

The steel framing system specified depends on the height of the infill wall, the weight of the cladding and the wind load. The higher the wall, the greater the stud depth and gauge will need to be – or tighter stud centres will be required to resist the loads. We can help establish the wind load using BREVE software once the facade arrangement, building height and location are known.

## DURABILITY

Our external sheathing boards are tested extensively to ensure that they will perform when installed in severe weather conditions and to achieve the required levels of mechanical and pull-out strength, even when wet. Our internal wall linings are tested for impact resistance and depending on your needs, we can provide wall linings which achieve a Severe Duty rating according to BS 5234-2.

## DESIGN AND ENGINEERING

Design and engineering of the PAF solution to EN1090-1 utilising BREVE to calculate wind loadings and the provision of a full set of construction drawings and details, along with an IFC file model.

## PERFORMANCE CALCULATIONS

Provision of a detailed project pack for the custom designed PAF solution which include system specification details, along with specific fire, thermal and acoustic performance calculations.

## CUSTOM MANUFACTURE

Custom manufacture of the panel solution to our customer's bespoke specification to meet the project's exacting requirements.

## PREFABRICATION

EOS's precision framing machines pre-cut, notch, dimple and swage the light gauge steel to exact sizes working to tolerances of +0/-2mm for frame dimensions.

## PREASSEMBLY

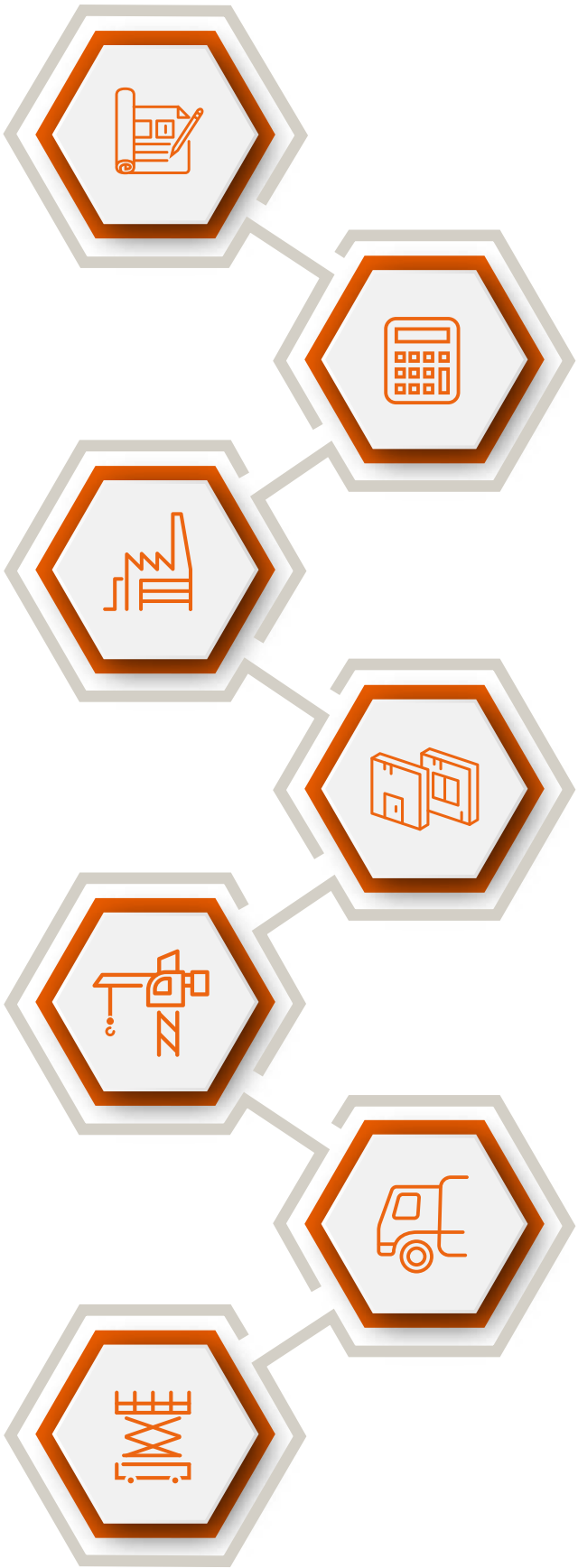
The Siniat Weather Defence boards are pre-cut and pre-fitted to the frames, reducing onsite waste. The board joints are factory sealed with a Siniat fire rated sealant. Each frame is specifically referenced and stickered to confirm intended location and colour coded per floor level to assist loading out on site.

## DELIVERY

EOS will deliver the Pre-Assembled Frames to site 'just in time' to meet the project programme. Frames are typically in bundles of five high and shrink wrapped to avoid any risk of water pooling during transportation whilst laid flat. Lorries can be loaded to suit crane or forklift offload depending on site requirements.

## INSTALLATION

Pre-Assembled Frames are designed to size to aid site installation and lifted onto the correct floor level using the colour coded label system. EOS drawings and site-specific details will illustrate how the system is to be installed. EOS technicians will attend site to deliver a toolbox talk and will attend site periodically to provide technical support during the build process.

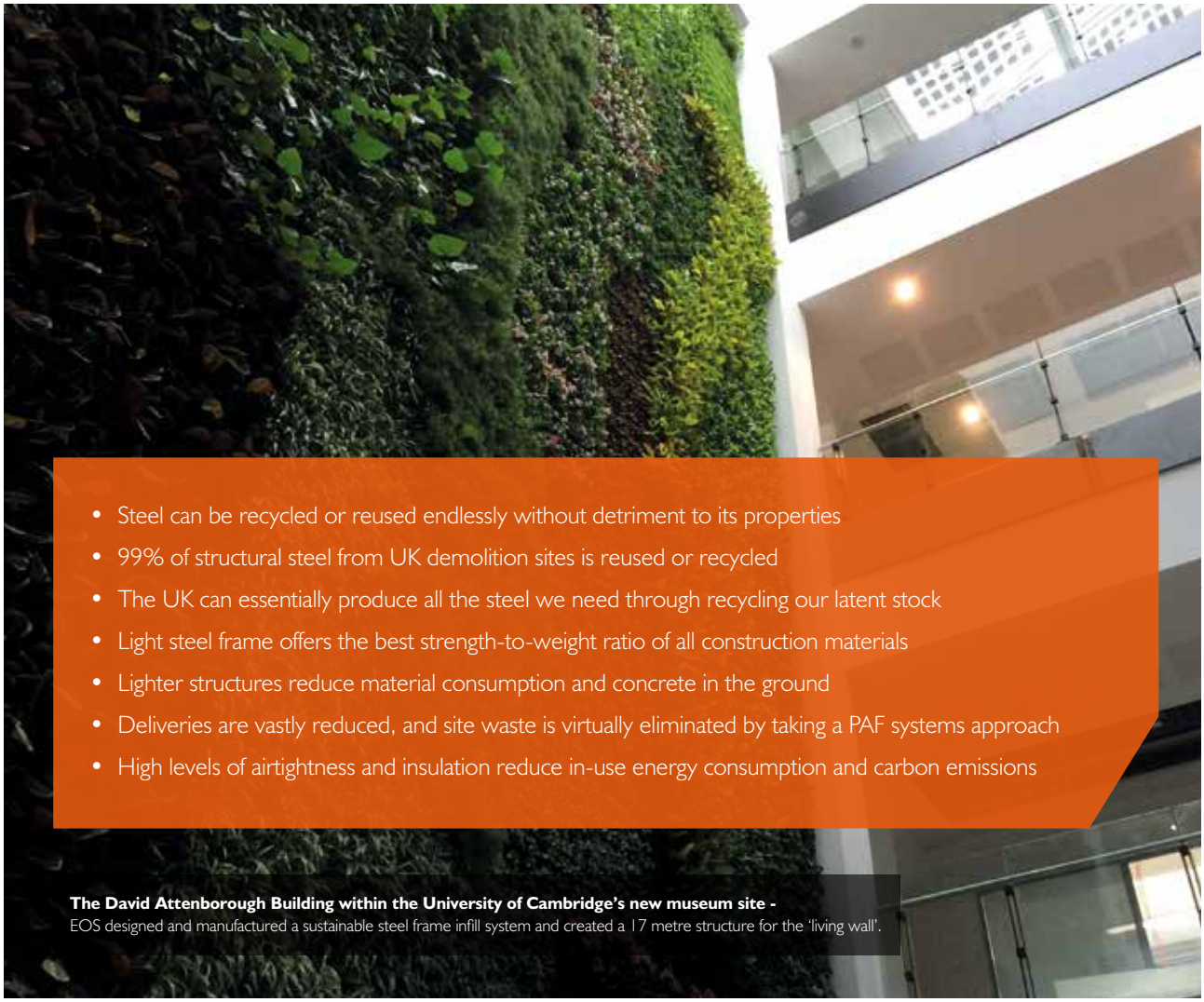


# STEEL & **SUSTAINABILITY**

**As part of Etex Group, EOS want to inspire construction professionals to build spaces that are safer and more sustainable. There are five overriding value benefits associated with light steel frame construction – safety, quality, speed, strength but sustainability is often overlooked.**

Manufactured from the most abundant component on earth, steel can be recycled or reused endlessly without detriment to its properties. Offering the best strength-to-weight ratio improves efficiencies. Lighter structures not only reduce material consumption but also concrete in the ground. This means that foundation loads and sizes are reduced by over 70% relative to concrete and block-work construction.

Site waste is virtually eliminated using a Pre-Assembled Frame approach as components are cut to size, factory manufactured and pre-assembled offsite. The use of advanced prefabrication techniques offers a vastly more sustainable approach when compared to the industry average wastage of 10% in construction materials.



- Steel can be recycled or reused endlessly without detriment to its properties
- 99% of structural steel from UK demolition sites is reused or recycled
- The UK can essentially produce all the steel we need through recycling our latent stock
- Light steel frame offers the best strength-to-weight ratio of all construction materials
- Lighter structures reduce material consumption and concrete in the ground
- Deliveries are vastly reduced, and site waste is virtually eliminated by taking a PAF systems approach
- High levels of airtightness and insulation reduce in-use energy consumption and carbon emissions

**The David Attenborough Building within the University of Cambridge's new museum site -**
EOS designed and manufactured a sustainable steel frame infill system and created a 17 metre structure for the 'living wall'.

# TECHNICAL PAF CASE STUDY

# RIVER STREET TOWER

**Highly commended in The Tall Building Awards, River Street Tower, Manchester is a £110 million development located between River Street and Garwood Street, next to the Mancunian Way. The scheme encompasses 791 student bedrooms within a 32-storey building and includes a mix of studios, cluster bedrooms and apartments as well as amenity spaces. Designed by award winning architects Simpson Haugh and Partners, the project brings high quality, affordable student accommodation to Manchester.**

## CONSTRUCTION

The outer elevations comprise a combination of Cor-Ten weathered steel rainscreen, in contrast the inner courtyard elevations comprise a combination of coloured dark-blue back-painted glass rainscreens and dark-blue metal panels.

The construction solution for River Street comprises a main frame concrete structure with infill panels. The offsite manufactured Pre-Assembled Frames were pre-boarded and insulated in EOS's quality-controlled factory using light steel frames from EOS and A1 non-combustible Weather Defence boarding from Siniat as part of an Etex package.

Manufacturing a high performance, airtight building envelope reduces carbon emissions and energy requirements for the lifetime of the building. By decreasing deliveries to site through taking an offsite manufacturing approach, reduces carbon emissions from vehicles and minimises disruption to the local area.

## EOS INVOLVEMENT

The prefabrication of the individual steel elements took place under controlled, highly regulated and safe factory conditions. With so much work completed offsite, the onsite construction schedule was reduced, and the build programme was relatively unaffected by adverse weather conditions. The PAF systems were pre-panelised complete with boarding and insulation as part of the offsite manufacturing process - reducing the need for working at height. No cutting or hot works were required onsite for the Pre-Assembled Frames which improved site safety.

Once the frames were designed using our 3D Tekla modelling software, all elements were rolled directly from the BIM model ensuring quality and accuracy. Preassembly means that offsite manufactured elements are made ready to ship to site ahead of programme and can be left exposed to the elements for 12 months prior to final finishes being applied. All products were manufactured under strict quality management systems fully compliant with BS EN ISO 9001:2015. Our accredited quality management systems and procedures eradicate onsite variability and ensure lifetime 'in service' performance and durability.

## POSITIVE OUTCOMES

- Early project team engagement and BIM integration was crucial to the success of the project.
- Additional studs and brackets were included from the outset as well as the forming of all vent areas.
- Windows could be fitted without glazing to speed up build.
- Removing the Pre-Assembled Frames from the critical path eliminated risk.
- Fitting from inside the building, removed the need for mast climbers at this stage of the build.
- Installers were tethered to the building's core increasing onsite safety.
- Through DfMA principles, EOS eliminated waste and value engineered all the preassembled SFS systems.
- Installers could work two floors below the concrete forming.
- An offsite approach delivered a 30% saving on the installation programme.

# PRODUCT CREDENTIALS
## AT A GLANCE

### SINIAT WEATHER DEFENCE BOARD

- Reaction to Fire = Euroclass A1 (EN 13501-1) Non-combustible
- Third party approval = BBA Certificate 10/4725
- Compliance = EN 15283-1: Types GM-F, GM-HI & GM-I

### EOS STEEL FRAMING SYSTEM

- Reaction to Fire = Euroclass A1 Non-combustible (industry standard)
- Manufactured under ISO 9001:2015 quality management systems, ISO14001:2015 environmental management systems and ISO45001:2018 health and safety management

### EOS PAF PERIMETER FIRE GASKET

- Reaction to Fire = Class E (exempt from minimum classification under Regulation 7(3) in relevant buildings)
- Fire Resistance – tested within the PAF system (detailed below)

### SINIAT DB BOARD PERFORMANCE

- Reaction to Fire = Euroclass A2,sl-d0 (EN 520) Limited Combustibility
- Compliance = EN 520: Type D & Type I

### POSSIBLE SINIAT BOARD OPTIONS

- Siniat dB Board (minimum requirement)
- LaDura Board (high impact and durability performance areas)
- Aqua Board (wet and bathrooms areas)
- Megadeco Board (for faster decoration and impact resistance)


# SYSTEM TEST INFORMATION
## AT A GLANCE

### PRE-ASSEMBLED FRAME INFILL SYSTEM

(including EOS PAF Perimeter Fire Gasket at edge, panel-to-panel connection and head arrangement)

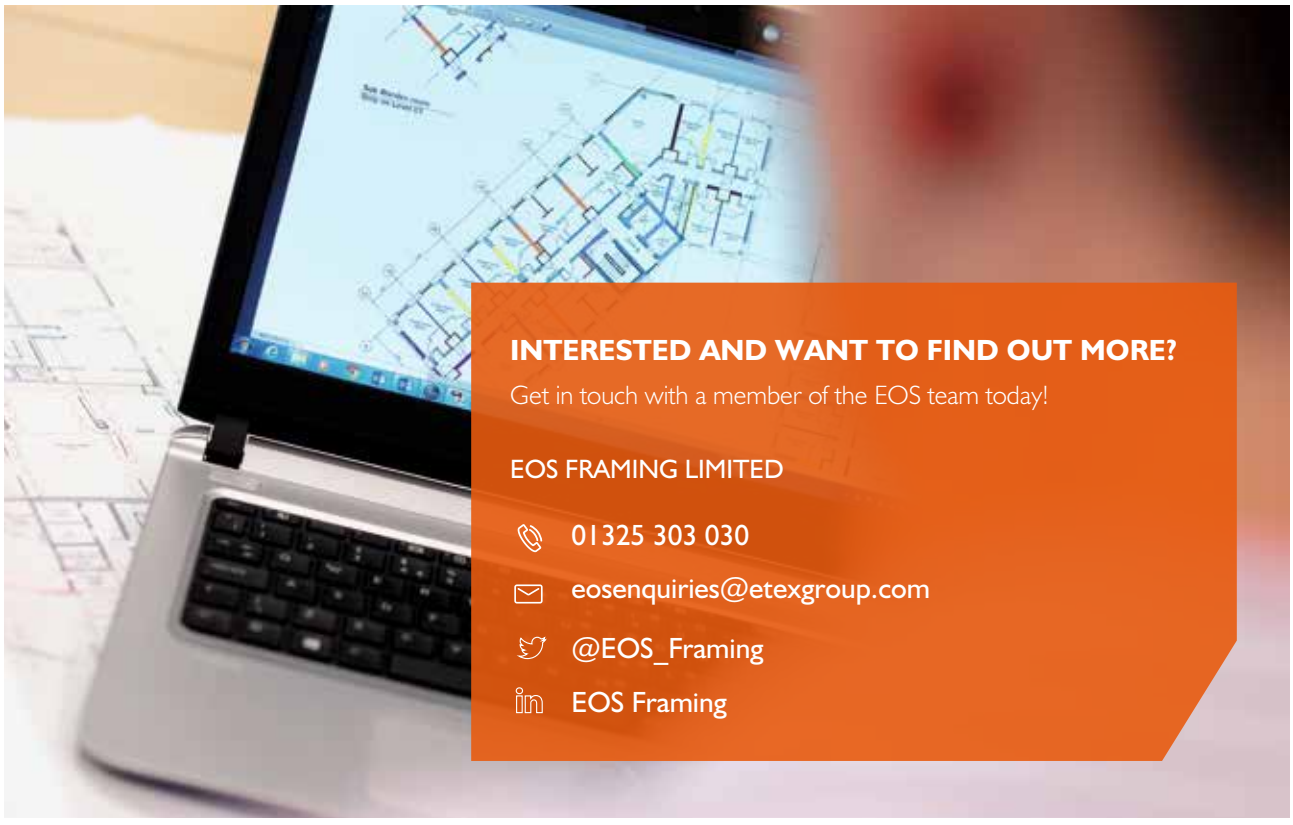
- Fire Resistance (EN 1364-1) In to out (Test Ref: Warringtonfire 438654) = Result EI 60
- Fire Resistance (EN 1364-1) Out to in (Test Ref: Warringtonfire 501425) = Result EI 60

# PRE-ASSEMBLED FRAMES

## FACT FILE

**Pre-Assembled Frames deliver vast cost and programme savings and ultimately achieve a faster return on investment.**

- 30-year product and performance Etex warranty
- Rigorously tested for certified performance
- Eliminates uncertainty of the design and specification of external envelopes
- Fire tested to 60 minutes (integrity and insulation) to EN1364-1 in both directions
- Suitable for buildings with a height of more than 18 metres
- Acoustically modelled according to ISO 10140-2
- Delivers crucial time benefits making programme savings of up to 30%
- Offers the best strength-to-weight ratio to improve efficiencies
- Installation from inside the structure reduces working externally at height
- Reduces mast climber and scaffolding requirements offering vast costs saving
- Just in time deliveries save space on site storage
- Site waste is virtually eliminated saving disposal costs
- Preassembly and prefabrication takes months off construction schedules
- Delivers faster return on investment



**INTERESTED AND WANT TO FIND OUT MORE?**

Get in touch with a member of the EOS team today!

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EOS Framing

EOS

Taking a Safety-First Approach
Protected by
THRUWALL® PAF
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