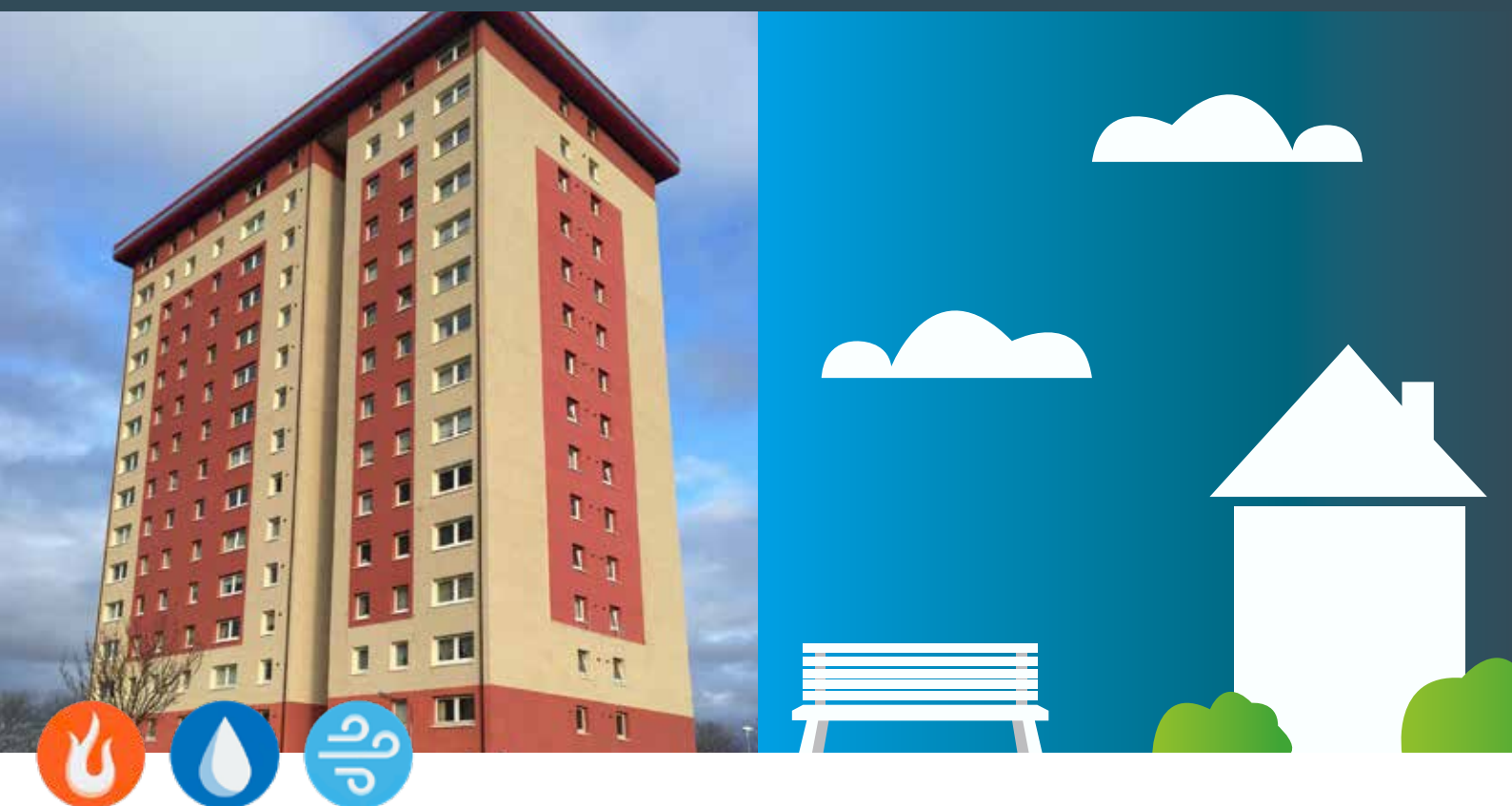




External Wall Insulation - The Steps to Safe High Rise: *Specification & Installation*



High Rise Safety

Wetherby Building Systems

A step by step guide to the correct design, install and aftercare of high rise buildings





High rise failures have come under the spotlight recently with renewed pressure being placed on the EWI industry following on from well documented failures such as Grenfell Towers.

This brochure has been put together to emphasise the lengthy measures Wetherby Building Systems take in order to ensure high rise buildings are correctly designed and systems accurately installed.

This is completed through a stringent process which is detailed in this easy to follow step by step guide.

Fire safety is of the utmost importance to Wetherby Building Systems and under no circumstances do we use desktop studies throughout our testing and certification.

All systems are fully tested prior to application so you can be assured that your building is safe. Wetherby Building Systems take the same approach when it comes to wind loading to ensure any system applied can withstand the additional pressures put on them.

All this is done through critical detailing which is highlighted throughout this document ensuring systems are correctly detailed and designed to last.

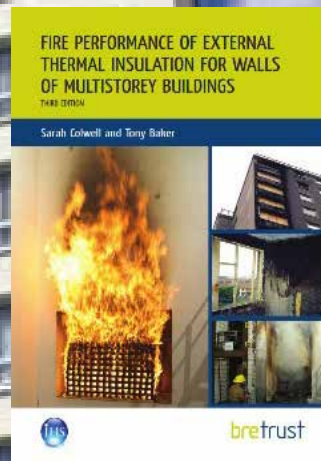
By following these strict guidelines we can ensure our systems are not only durable but minimum maintenance is required in the future.

Wetherby Building Systems under Lyme College





Heathcote Point, London



BBA/ETA Fully Tested System

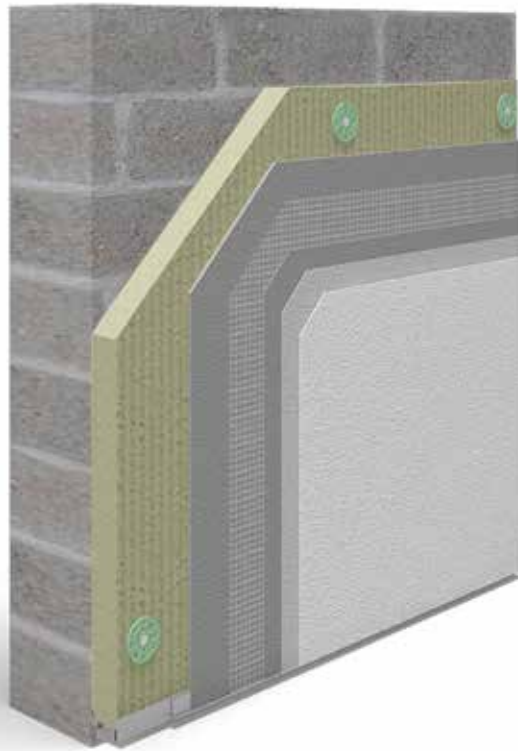
Wetherby will only specify fully BBA/ETA tested systems for use on high rise projects. The system is fully tested to the appropriate European Standards (e.g. ETAG 004 for masonry).

Fire Performance

Unrivalled Number of Systems Tested to BR135. Wetherby only specify systems of limited combustibility. (A Fire Rated Systems to EN13501-1), or Systems fully tested to BS8414 / BR135.

As per Building Regulation requirements, Wetherby do not use desktop studies and full systems are tested to the above standards for high rise projects.





Thermal Performance Ensuring U-Values Are Achieved

Project specific U-Value calculations are completed for the existing substrate to show the benefits of an EWI system.



Surface temperature to avoid critical surface moisture:
No danger of mould growth is expected.



Interstitial condensation:
No condensation is predicted at any interface in any month.

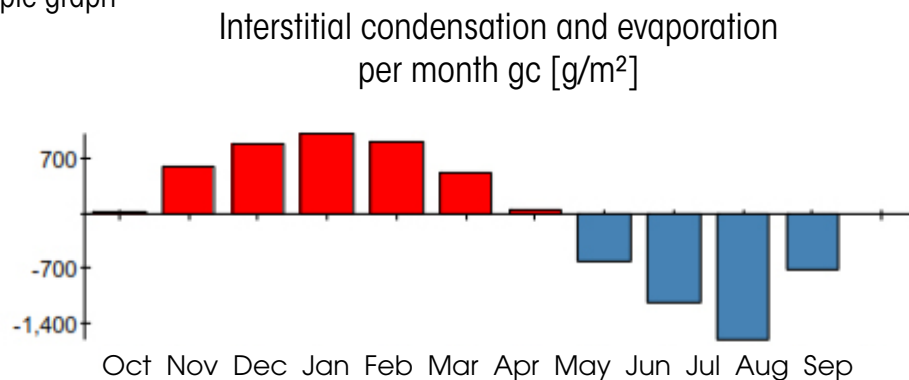




Condensation Risk Analysis

As part of the U-Value calculation a Condensation Risk Analysis is carried out to ensure no problems after install.

example graph



Preliminary Specification

Wetherby will complete a 14 page preliminary specification for the project providing information on the system and a photo application guide. This specification is subject to pre-installation surveys.



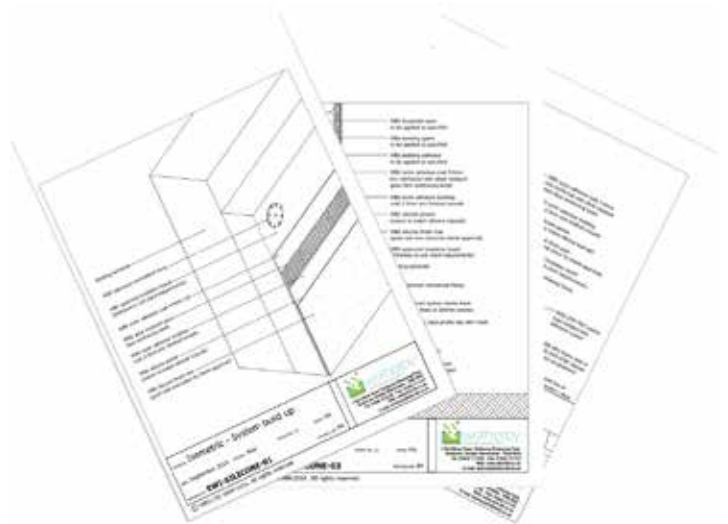
n55Plus

Pre-Installation: Step 2



Structural Survey + Ventillation Checks

A structural survey must be completed to confirm the buildings condition and suitability for installation of an EWI system. Any required repairs must be completed before the EWI system is installed. Ventillation checks must be completed to ensure adequate ventilation is in place.



Wetherby Survey: Site Specific Detailing & Drawings

Wetherby Site Supervisor will attend site to inspect the substrate and confirm the suitability or advise of any substrate preparation required before work begins.

A survey of bespoke site specific details can be agreed alongside the installing architect/contractor. Custom CAD detail drawings can then be completed and issued specific to the project.

Pull Out Testing

The fixing manufacturer will be deployed to site to carry out the required pull out testing. This will include a minimum of 15 tests (to ETAG 014 guidelines). Further pull out tests will be completed on the project as works commence to ensure the substrate is consistent.



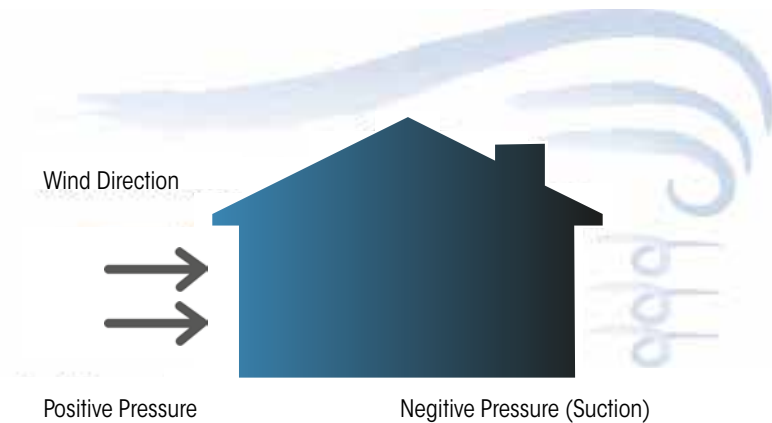
Pre-Installation: Step 2



Wind Load Calculations

A wind load calculation specific to the building must be completed in accordance with BS EN 1991-1-4.

This will provide figures for the maximum wind loads taking into consideration the buildings location, orientation, surroundings, building height and building design/shape.



Site Specific Fixing Patterns

Wetherby will use the site specific wind load data to provide a suitable fixing pattern for the project. This calculation will ensure the specification is correct in regards to:

- 1) Pull out - fixing performance into the substrate.
- 2) Pull through - resistance to the insulation pulling over the fixing head.
- 3) Bond strength of the system - ensuring the bond of the system layers can withstand the wind loads.



Training & Installation Report: Step 3

Wetherby Approved Installers

Only Wetherby approved and suitably experienced installers would be considered for high rise schemes.

High Rise Approved Installers (Trained by Wetherby)

All applicators must be Wetherby approved for high rise projects. This is achieved through high rise specific training carried out by Wetherby.

Site Support & Inspections

Wetherby Site Supervisors will inspect high rise projects on a weekly basis as a minimum. Standard of work and competence of applicators will be inspected. Application solutions will be offered quickly and backed up by Wetherby Detail Drawings to ensure projects can continue to run smoothly. Site reports are provided for each visit which will include any actions that may be required.

Nominated Wetherby Support

A Wetherby support team will be specified and dedicated to a high rise project. This will include an Area Technical Manager, Site Manager and a nominated Sales Order Processor.



Maintenance, Aftercare & Warranties: Step 4

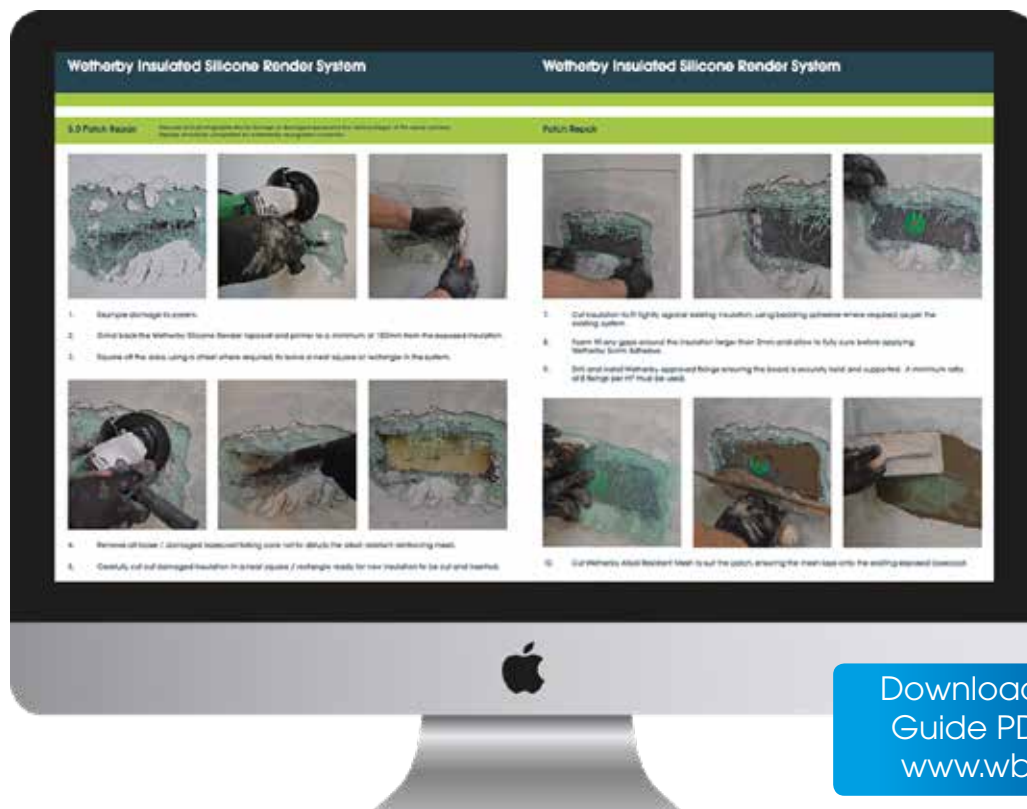
Project Specific O&M Manual

A project specific O&M manual will be issued on completion of the project with information on the exact system installed. The O&M includes information on a range of areas including aftercare, guidance on installing items onto or through the EWI system, changing windows or doors and repairs in event of damage. Maintenance requirements and cleaning is also included to ensure the system remains in good condition throughout its life cycle.



Repair Guide

Wetherby specify high impact robust systems reducing the likelihood of damage. A full photo repair guide is provided within project specific O&M Manual for any minor repairs or full patch repairs required to the installed system. Wetherby technical information is also provided for queries on remedies.



Download our Repair Guide PDF online at www.wbs-ltd.co.uk

Maintenance, Aftercare & Warranties: Step 4

Information on Living in a Building after EWI Installation

Information for tenants on living in an extremely insulated building is also provided, giving guidance on:

- The effect of EWI
- Reducing heating usage
- The importance of the correct ventilation
- Living habits



Third Party Insurance Backed Warranties

Wetherby work with a number of Ofgem approved Third Party Warranty Providers. Wetherby are a founder member of SWIGA and have SWIGA approved high rise systems.

25 year warranties are available for funded schemes, fully backed by approved providers to give security to clients and tenants.

Sandwell High Rise, Thompson Gardens, Birmingham





Summary of Fire Testing Standards

Wetherby have spent significant time and resources on ensuring all of our EWI systems are fire tested to the highest level.

Only systems with the correct testing and certification will be specified on high rise schemes and under no circumstances do we use desktop studies throughout our testing, certification or specifications.

Test Standard States

Explanation

BS 476 Part 6 Fire tests on building materials and structures. Method of test for fire propagation for products.	This testing is required for BBA certification and shows the system complies with building regulations for buildings under 18 metres in height. These tests provide the system with a Class 0 fire rating.
BS 476 Part 7 Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products.	This test provides a fire classification for the system. A rated systems are classified as non-combustible or limited combustibility which confirms suitability for use on high rise buildings. The EN13501-1 test has recently replaced the BS476-6 / 7 testing as a BBA certification requirement.
EN 13501-1 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests.	
BS 8414 Fire performance of external cladding systems. Test methods for non-loading bearing external cladding systems applied to the face of building substrates.	This certification outlines the test method for an EWI system to be tested to the BR135 standard.
BR 135 Fire performance of external thermal insulation for walls of multi-story buildings.	This certification provides the test data from the large scale fire test and provides confirmation on the systems suitability for high rise buildings.



BS8414 / BR135 Fire Test

The BS8414 / BR135 Fire Test is the most comprehensive EWI fire tests in the world. The system is installed onto a large 9 metres high test wall and is exposed to flame temperatures of 800 to 1000 degrees and a 3.0MW (+/- 0.5MW) heat output.

The test lasts 30 minutes with observations up to 60 minutes and to pass there must be no structural collapse, no surface spread of flame and the wall must not propagate the fire.

Substrate	Insulation	Finish
Masonry	Enhanced EPS	Silicone
Masonry	EPS	Silicone
Masonry	Stone Wool	Silicone
Masonry	Enhanced EPS	Dash
Masonry	Phenolic	Dash
Steel Frame	Epsitec Cavity + Phenolic (Rail fix)	Silicone
Steel Frame	Epsitec Cavity + Epsitherm (Rail fix)	Silicone

Hickman High Rise, Wolverhampton





The EWI industry has come under much scrutiny surrounding wind loads and the design aspects of EWI systems. The Grenfell Towers report highlighted a particularly high profile EWI failure in Scotland which resulted in the insulation and render falling from a high rise building. This led to EWI certificate holders being assessed by the BBA to ensure they understood wind loading and were able to design an EWI system to resist the wind loads a highrise project would be exposed too. Wetherby value the importance of high rise specifications and as a result were only one of three out of the 38 certificate holders assessed to provide acceptable information to show the design of our EWI systems comply.

Designing the System and Fixing Pattern

1. A wind load calculation to BS EN 1991-1-4 must be completed by a suitably qualified and experienced structural engineer to provide maximum wind load figures for a building in kN/m². This will provide info on the zones of the building where the highest pressures will be applied. A safety factor is applied to this figure to provide a design wind load value.
2. On site pull out tests will provide test data to ETAG014 for the building providing information on the loads the fixings will resist with a large safety factor incorporated.
3. Data is taken for the insulations pull through values, figures showing how much force is required to pull an insulation board over a fixing head. Again a large safety factor is applied to these figures.
4. Figures for **bond strength** are checked to ensure the system finish can resist the wind loads applied to it.
5. Wetherby will confirm the fixing pattern for each individual project or scheme ensuring the fixing pull out, pull through, and bond strength values per m² are higher than the maximum wind loads provided in the BS EN 1991-1-4 calculation.

Insulation Bedding Adhesive

On high rise masonry buildings, Wetherby specify a full coat of bedding adhesive behind the insulation before mechanical fixings are installed. The bedding adhesive is not taken into consideration when analysing wind load calculations and can often provide wind load resistance values higher than the mechanical fixings. Bedding adhesive provides an extremely good bond and is simply specified as a Wetherby belt and braces approach to high rise installation, ensuring a safe and extremely secure mechanically and adhesively fixed system.



FIRE CASE STUDY

EWI - GASCOYNE EST & LINCOLN COURT



Heathcote Point (mid-rise) and Lincoln Court (hi-rise) where two large projects completed in the same year with a Wetherby encapsulated insulated render system. Both projects were subject to major flat fires a year after completion of the works.

The photos show the system is only slightly affected, an example of extremely good fire resistance. Neither the insulation material nor render on these projects show any fire spread and the fire was contained to just the one home as fire was unable to spread to other flats. The remedial works to the system were minimal.

"Non-combustible insulation within a encapsulated render system"

Lincoln Court



Mineral Wool Insulation Render System

Standards

EWI Slab is non-combustible insulation made from inorganic rock wool

Thermal Performance

EWI Slab has a thermal conductivity of 0.036 W/mK, 100mm - 110mm is required to comply with building regulations depending on the substrate.

Fire Performance

EWI Slab is classified as Euroclass A1 to BS EN ISO 13501-1, EWI Slab can be used up to an operating temperature of 850°C. In the event of fire it will emit negligible quantities of smoke and fumes. The heat emission from the products is insignificant.

Wetherby renders all achieve class 0 spread of flame

Wetherby have completed a large number of fire tests to BS 8414 which is a extremely stringent test providing the highest testing standard in the industry and allowing use of our systems on high rise buildings.





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creating a greener future



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