

# STROUD DISTRICT COUNCIL



## Mosley Crescent EWI: Retrofit Design Proposal

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1.0	November 2023	

**Prepared by** [REDACTED]

**Checked by** [REDACTED]

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**Date:** 06/11/23



















**Contact details:**

[REDACTED]

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**A Property Details**

<b>Address</b>	Properties: 11 - 18
<b>Front Elevation</b>	Double fronted Semi-detached
<b>Property Type</b>	Dorlonco
<b>Build Year</b>	1950 to 1966
<b>Reference Documents</b>	<ul style="list-style-type: none"> <li> Severn wye Measures Evaluation Summary</li> <li> Severn wye Ventilation Strategy</li> <li> Elmhurst Energy Condition Report</li> </ul>
<b>Existing Defects</b>	<ul style="list-style-type: none"> <li> Evidence of damp, mould and condensation throughout</li> <li> Inadequate undercuts on doors</li> <li> Significant rust on bathroom radiator</li> <li> Inadequate ventilation system in kitchen</li> <li> Inadequate ventilation system in bathroom</li> </ul>
<b>EWI Installation Constraints / Considerations</b>	<ul style="list-style-type: none"> <li> Removal of plants close to the buildings</li> <li> Narrow side access</li> <li> Fence posts attached to properties</li> <li> Timber structures and or decking attached to rear of some properties</li> <li> ACO drains abutting some properties</li> <li> Cast iron SVPs present</li> <li> New roof to be installed to properties 11-17</li> <li> Gas meter box on rear wall (EWI detail required)</li> <li> Verge extension via gable ladder to overhang EWI</li> <li> Overhead power cables to properties</li> </ul>
<b>SDC Preferred Scenario</b>	11 – Scenario 1 12 – Scenario 1 13 - Scenario 2 14 – Scenario 1 15 – Scenario 1 16 – Scenario 2 17 – Scenario 1 18 – Scenario 1

**B General Scope of Work Summary**

<b>To Achieve EPC C71</b>	
<b>EWI &amp; Associated Works</b>	Wetherby Specification: 90mm Enhanced EPS & HECK 4S Silicone K 1.5mm. HD EPS 70mm below DPC
<b>Installations of new uPVC Windows</b>	uPVC windows installed by PAS 2030 accredited installers
<b>Loft Insulation</b>	400mm Knauf Loft Roll 44 Combi Cut
<b>Kitchen Extract Fan</b>	Vent Axia Response 7 (494143)
<b>Bathroom Extract Fan</b>	Vent Axia Revive 7 (473848)
<b>GRP Canopy</b>	Wessex Downton Replica Tile Roof 700mm * 1650mm
<b>Internal Doors</b>	Work to assist ventilation - undercuts
<b>Mould</b>	Treatment of internal mould spots
<b>Internal Leaks</b>	Check internal pipework and repair leaks

## C Specifications

### WETHERBY BUILDING SYSTEMS

Wetherby Buildings Systems are the UK's market leading EWI system supplier, providing quality products and systems and unrivalled technical and on-site project support. We aim to provide environmentally responsible and sustainable building products of the highest quality, continually improving on our quality and system accreditations to ensure that optimum standards are met.

### WETHERBY PREMIUM CERTIFIED PRODUCTS

Wetherby Buildings Systems products and EWI systems are tested to the highest level with an unrivalled range of BBA, BDA and ETA certificates available for use on projects in the UK. All testing achieves the highest European standards, ensuring long term durability, strength and premium performance. BBA/BDA approved systems provide a minimum life expectancy of 30 years. BRE Fire Certification has also been achieved for a large number of systems, with certain certification extending to 60-year life expectancy.

### UK MANUFACTURING

Here at Wetherby, we take our responsibility to 'Buy British' extremely seriously. All of our current and potential suppliers undergo a rigorous annual assessment. Each supplier is reviewed over a number of areas including responsible procurement, product suitability, commitment to sustainability, quality etc. Only when we are completely satisfied are they included on our Supply Chain Database.

### ISO 9001, ISO 14001, & ISO 45001

Wetherby Building Systems have a strong pro-active approach to internal Quality Systems, Environmental Management Systems and Health and Safety.

Our ISO Integrated System is regularly audited internally by qualified auditors and annually by independent external auditors, Alcumus ISOQAR. This ensures consistency in the supply and quality of our materials and services, and our environmental responsibilities and targets which we take very seriously. This includes our ongoing commitment to recycle, re-use, reduce GHG's and improve products and systems alongside our partners and suppliers. The main aim is to maximise sustainability for all products and systems across our extensive range. We have a strong pro-active approach to Health and Safety. We manage all risks associated with our activities by regularly monitoring our premises, revising Risk assessments, Safe Systems of work, and Method Statements when required. We strive to provide the best training, support, and management on all our projects providing knowledge and experience throughout the task being undertaken.

### TECHNICAL SERVICES

Wetherby offer a wide range of technical services to support project design and system installation. In depth NBS Specifications, project specific CAD drawings, photographic overlays, U-values and condensation / humidity risk analysis documents are all readily available via our Technical Support Team. For Technical Enquires please contact on 0800 1073299 or [technical@wbs-ltd.co.uk](mailto:technical@wbs-ltd.co.uk)

### TRAINING SERVICES AND TRAINED APPLICATORS



**We provide a variety of in-depth training courses, covering all systems, to ensure that installations are completed to the highest possible standards.**

**For training enquires please contact: 01942 529336.**

**For information on our Trained Applicators please contact your Area Sales Manager as per details on page 2 of this specification.**

### **SITE SUPPORT, PULL OUT TESTS AND INSPECTIONS**

Wetherby Building Systems offer unrivalled site support for EWI projects with 8 Site Supervisors strategically positioned across the UK. Pull out testing, product information, detailing advice and application assistance are all available from our experienced team.

### **SAMPLE SERVICE**

We provide a FREE sample service for all of our products and systems.

To access this service, contact our sample department on 0800 1073288 or alternatively e-mail [REDACTED] who will be more than happy to assist you with your enquiry: [REDACTED]@wbs-ltd.co.uk

### **GUARANTEES**

Wetherby can provide a guarantee covering defects in materials on Wetherby BBA / BDA / ETA approved EWI systems installed by Wetherby recognised contractors, for the first 10 years of the system lifespan\*. Extended guarantees are available for government backed schemes provided by carefully selected third party insurance partners such as SWIGA and GDGC\*. Please contact WBS for further information.

(\*conditions apply)

### **CDM REGULATIONS 2015**

Wetherby Building Systems provide technical support as a supplier of façade systems and we hold the position of 'designers' according to the CDM Regulations 2015.

Wetherby have a number of legal responsibilities in this role when preparing or modifying designs, to eliminate, reduce or control foreseeable risks that may arise during construction, maintenance and use of a building once built. We are also obligated to provide timely information to other members of the project team to help them fulfil their duties.

Further information is contained in our CDM document (WF224) which is applicable to all designs and is available on our web site ([www.wbs-ltd.co.uk/xpagex](http://www.wbs-ltd.co.uk/xpagex)) or on request

### **PAS2035:2019**

The PAS2035 design process must be followed as per the PAS document "PAS 2035:2019 Retrofitting dwellings for improved energy efficiency – Specification and guidance".

It is essential the correct surveys are completed, risk assessments are carried out and the roles and responsibilities are agreed, including a Retrofit Coordinator, taking responsibility for the specific property design.

This specification must be agreed and signed off by the project specific Retrofit Coordinator, as the PAS2035 provides a whole- house approach.

## PAS 2030:2019 REQUIREMENTS

### PAS 2030:2019 PRE-INSTALLATION BUILDING INSPECTION REQUIREMENTS

- **Pre-installation Building Inspection Requirements**

1. To meet the requirements specified in PAS 2030:2019, the designated competent person assigned by the installer shall confirm that:
  - a) A full and detailed pre-design building survey has been undertaken by a competent person (see B4-I3 of the PAS), prior to the retrofit design being undertaken; and
  - b) The retrofit design relevant to the installation under inspection has been produced in accordance with PAS 2030:2019, taking full account of the findings and recommendations of the pre-design building assessment, including:
    - thermal performance calculations
    - condensation risk analysis
    - ventilation requirements and standard / bespoke drawing details
    - the main components of the system including the fixing type / method, the insulation type and thickness, the joint details and specifications, the reinforcing coat and type of reinforcement and the finish;
    - the proposed details for the main interfaces; (thermal bridging, meter boxes, reveals, roofline joists, party walls, base detail with particular reference to below dpc, base/floor details, seals at windows/doors, seals to penetrations, light fittings, sockets, fixing and sealing of surface mounted structures, interfaces with ceilings, interfaces with roof, junctions between the system and other finishes and/or other EEM) clearly demonstrate how the installation will avoid condensation risk particularly at moisture sensitive locations such as timber joist ends and within the wall structure (interstitial/surface condensation); and
    - the installation to the retrofit design is practical and achievable given the particular EWI system chosen for the project and the specific dwelling construction, site conditions and other EEMs planned for the property. (See also the Measures Interaction matrix Figure A.1).

#### **2. As a minimum the pre-installation building inspection shall investigate and assess if the EWI installation work will:**

- result in non-compliance with the Building Regulations, e.g. in relation to workmanship, materials, structural stability, fire safety;
- provide resistance to moisture. Where possible, any areas of non-compliance shall be rectified by selection of another solution/ detail, which shall be documented in the pre-installation building inspection and all contract documentation amended accordingly i.e. specification, drawings, method statement;
- result in avoidable thermal bridging; where thermal bridging is avoidable by adaptation of the detail, such measures shall be taken and the contract documents amended to suit. Design details shall be such that they incorporate additional capacity, that for example, will provide water management within the system should surface or interstitial condensation occur;
- result in unsafe operation of combustion appliances; unless an alternative safe detail can be found, EWI works shall not progress in the area causing the unsafe operation;
- compromise the functionality of existing ventilation ducts/systems; unless an alternative safe detail can be found, EWI works shall not progress in the area causing the unsafe operation;
- compromise the functionality and/or safety of existing services (gas, electric, water, telephone, etc.); unless an alternative safe detail can be found, EWI works shall not progress in the area causing the unsafe operation; and



- result in the proposed installation being non-compliant with any requirements of the EEM supplier or of the retrofit design.

**3.** The pre-installation building inspection shall include confirmation that the condition of the substrate is suitable for the works to commence and where all or any of the substrate does not fulfil the requirements for installation, preparation of proposals for adaptations to be made or additional preparation undertaken that will be necessary in order that works can commence.

**4.** All instances of potential non-compliance identified in the pre-installation building inspection shall be documented and referred to the Retrofit Coordinator for resolution. Any design adjustments, special adaptations and/or additional preparation requirements shall be confirmed as acceptable in writing, by the system supplier and/or the Retrofit Coordinator.

**5.** The retrofit design documentation shall be amended to include any specified changes to the installation, the installation method statement modified accordingly and the pre-installation building inspection records updated to provide documentary evidence that the intended modified installation will address all the issues identified in the pre-installation building inspection and meets the requirements of all parties.

NOTE: In undertaking pre-installation building inspections it is recommended that Installers consider using an industry recommended checklist e.g. the External Wall Insulation pre-installation building inspection checklist [N7] (see 10.7.1).

### **PAS 2030:2019 ADDITIONAL INSTALLATION REQUIREMENTS**

The Installer shall ensure that the methods used for the installation of external wall insulation (EWI) products or systems are as recommended by the system supplier and in accordance with the relevant retrofit design and incorporated in the installation method statement.

#### **In undertaking the installation, the installers responsibilities shall include:**

- a)** Before installation starts, confirming that the retrofit design has made provision for ensuring that:
- the EWI system provided for installation is that recommended by the pre-design building survey and specified by the retrofit design;
  - wind loads have been calculated and taken into account in the fixing requirements;
  - all essential ventilation openings that require sleeving or safeguarding before installation are located and identified;
  - the position of all flues whether or not they are in service is determined and the measures that shall be taken to safeguard their proper functioning is determined;
  - any existing cables, pipework, ducting etc. that require it are removed or repositioned as/where necessary to accommodate the planned EWI system, with authorization from the relevant responsible body (where required) and undertaken by a person competent to undertake such work;
  - the existing ground levels, paths or decking adjacent to the dwelling are 150 mm below the level of the damp proof course; and
  - other areas of the dwelling and surrounding area that could be at risk during installation are adequately protected to ensure they are not damaged.

In the event that any of these aspects is not adequately covered, liaising with the Retrofit Designer to provide for their undertaking.

**b) During installation, ensuring that:**

- all work is carried out in accordance with the site-specific retrofit design, drawings and method statement and that work is not permitted to progress unless copies of the site-specific specification documentation are accessible at location and all operatives are aware of the content and requirements relevant to their designated activities;
- the system and all detailed interfaces with other parts of the dwelling or other planned EEMs to be undertaken in a manner and sequenced such, that all measures are fully effective, with optimized performance and junctions that are safe, durable and fully weatherproof for all expected exposure conditions. e.g. interface between EWI system and planned replacement windows; and
- whether or not specifically required by the retrofit design, the items listed in i to viii below are given particular attention with regard to the efficacy and durability of the detail especially concerning the management and exclusion of moisture and/or the risk of surface/interstitial condensation or rising damp. Mastic sealants shall always be supported by a primary seal below, and all details shall be fully weatherproof:
  - i. system base detail (including below dpc);
  - ii. interfaces with roofs at eaves and verges (where metal or plastic cappings and trims shall not be used);
  - iii. window/door reveals/heads;
  - iv. system/cill interfaces (incl. overhang requirements/weepholes/thermal movement);
  - v. surface fixtures (structurally sound);
  - vi. penetrations through the system;
  - vii. interfaces with roof soffits, flat roofs, conservatory roofs etc.; and
  - viii. detailing and sealing around vents/flues, meters and other heating related structures/pipework. PLEASE REFER TO WETHERBY PAS2030:2019 DETAIL DRAWINGS FOR GUIDANCE
- all weather seals at the interface between EWI systems and other structures/finishes are installed with particular attention given to the soundness/cleanliness of contact surfaces, continuity and effectiveness around corners, bond to surfaces and the durability of the water seal;
- all details are installed to minimize the risks of thermal bridging, removing/relocating/extending to allow continuity of insulation in all cases e.g. rooflines, meter boxes, pipework, flues, ducts;
- photographic evidence of key stages of the installation is prepared and retained for the period of the guarantee, including close up photographs of representative examples of all moisture and thermally sensitive details;
- installations are undertaken in accordance with the specification for the installation of external wall insulation ensuring the safety and operation of fuel burning appliances, taking account of the recommendations provided in the document External wall External Wall Insulation Specification for Weathering and Thermal Bridge Control [N1] (see 10.7.1);
- ventilation of the dwelling is assessed and if necessary upgraded in accordance with the retrofit design and with the requirements of PAS 2035; and



- upon completion of the installation or at the end of each working day, if the installation takes longer than one day, the operatives investigate and confirm the proper functioning of all ventilation openings and flues.

NOTE 1 The relevant installation methods will have been included under current certification issued by a product certification body, with respect to the product/system to be installed, against UK requirements and regulation and the installer should be aware that training from the supplier or training acceptable to the supplier is necessary before an application for assessment/certification is made to a certification body.

NOTE 2 Attention is drawn to the need, where relevant, for all external wall insulation installation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, the need for compliance in relation to the following aspects is highlighted: fire safety; resistance to moisture; ventilation; and conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England is provided in Approved Documents A-P [N2] and Regulation 7: Workmanship and Materials [N3]. Further guidance on the requirements of the Building Regulations in Wales is provided in Approved Documents A-R [N4] and guidance on Regulation 7: Workmanship and Materials [N3]. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook [N5] and Non-Domestic Technical Handbook [N6].

### **PAS 2030:2019 INSTALLER COMPETENCE RATIO**

For each installation task to be undertaken, the installer shall employ or subcontract at the particular location, at least one vocationally competent operative. For each installation, the vocational competence ratio (see 3.28) shall be determined by the installer in relation to the:

- a) range, scale, geographical spread and complexity of the work being undertaken; and
- b) supervision and experience of the individual that meets the vocational competence requirements for the relevant tasks and the relative experience of the operatives being supervised;

but shall not be less than one carded operative per team of 4 (1 to 3), at the specified installation location at any time.

NOTE 1 Where a vocationally competent operative is newly qualified, it may be appropriate for a lower competency ratio to be applied.

For each installation task to be undertaken at a particular location, supervision, inspection and confirmation of compliance of all work undertaken in respect of that task at that location shall be undertaken by a vocationally competent operative appointed by the installer to do so.

NOTE 2 It is recommended that vocationally competent operatives carry a document supporting the nature, currency and source of that competency, for production upon request.

## WETHERBY EPSIWALL SPECIFICATION

### M21

#### Insulation with rendered finish

To be read with Preliminaries/General Conditions.

This specification is valid for 6 months from issue date, due to the changing industry regulations and requirements. For an updated version of the specification please contact the relevant technical sales manager.

This specification is specifically for the named project and is not transferable to other projects, projects require specific custom specifications, please contact Wetherby Technical departments for further information.

### GENERAL / SYSTEM REQUIREMENTS

#### 120 SURVEY OF EXISTING WALLS

- **Timing: Before starting work covered in this section.**
- **Objective: To confirm suitability for application of external wall insulation system.**
- **Survey report: Submit, covering all relevant matters listed below:**
  - The form and condition of the structural substrate.
  - A schedule of repairs and / or additional works necessary to render the substrate suitable to receive the system.
  - A schedule of services, fixtures and fittings requiring removal to facilitate installation of the system.
  - Proposals for treatment of potential cold bridges e.g. reveals, concrete floor edges.
  - Remove existing rainwater pipes and re-direct away from work surface whilst work proceeds. Ensure all rainwater from the roof area is carried away from the work area by means of temporary fixed rainwater goods.
  - Remove, extend beyond the surface of the proposed system and securely re-fix, to the satisfaction of the supervising officer, soil stacks, waste water pipes, overflows, vent pipes etc.
  - Any other information considered relevant.

#### 150 WIND LOADING

- When installed on suitable walls, the system can adequately transfer to the wall the self-weight and negative (suction) and positive (pressure) wind loads normally experienced in the United Kingdom.
- Wetherby or the fixing manufacturer will undertake fixing pull out tests on site to verify the adequacy of the fixings.
- Wetherby will provide information on the system dead load weights on request to allow an independent check to be made of the substrates adequate strength and suitability.
- On projects where higher wind load coefficients are expected, wind load calculations are required in order to establish the minimum number of fixings required per m<sup>2</sup> to resist the maximum wind loads acting on the building. In order to do this, wind loads must be calculated by a suitably qualified and experienced structural engineer in accordance with BS EN 1991-1-4:2005 and provided to Wetherby. Wetherby will then confirm an adequate fixing pattern for the project.

## 160 REMEDIAL WORK

- Remedial work shown to be necessary by survey: Employer's responsibility.

## 180 STRUCTURAL SUBSTRATE

- **Description: Existing Render on Masonry.**
- **Preparation:**
  - **Treatment to Existing Sound Surfaces**

Remove any loose material and existing render, where required dub out the surface level, ready to receive the EWI system. The existing walls are to be cleaned with a wire brush or pressure jet wash, to the satisfaction of the Contract Administrator, to remove any friable material, algae or lichen, and to provide a good key for Wetherby products. Treat areas of moss, algae and mould growth with WBS Biocidal Wash. Dense smooth surfaces may require treating with WBS Stabilising Solution / Bonding Agent to ensure adequate adhesion on wet fix or render only applications.

If the walls include existing render or the substrate isn't line and level and requires dubbing out, the fixing lengths stated within this specification may need to change. This will need to be confirmed on site prior to the installation of the Wetherby system. Sizing of flashings, trims and beads may also require alterations.

- **Dubbing Out**

Where necessary dub out, using Wetherby Dubbing Render, any hollow / defective areas to leave a suitable surface for the application of the insulation boards. Maximum dubbing coat thickness: 16mm.

- **Biocidal Wash**

Where required, apply one coat of Wetherby Biocidal Wash to the entire surface by roller or knapsack spray and allow to dry. Brush the surface to remove all signs of growth before rendering commences.

- **Stabilising Solution**

Where required, apply one coat of Wetherby Stabilising Solution to the entire surface by roller, ensuring uniform coverage and allow to dry.

- **Verge Trims to External Chimney Stacks**

The project Retrofit Co-Ordinator to approve the use of Verge Trims on the external Chimney Stacks – To be installed where red line is below.





## 210A EXTERNAL WALL INSULATION SYSTEM

- **Manufacturer:**

Wetherby Building Systems Ltd.

1 Kid Glove Road Golborne Enterprise Park Golborne

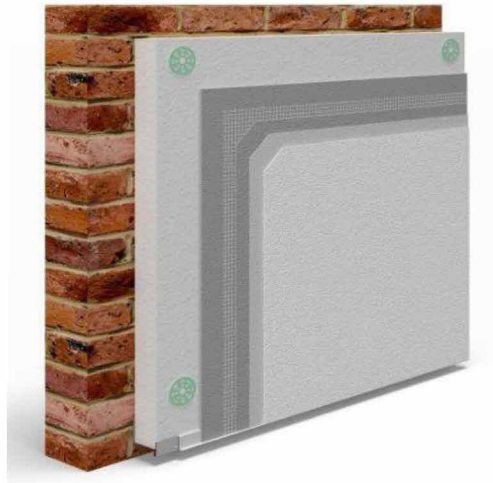
Greater Manchester WA3 3GS

Tel: 01942 717100

Fax: 01942 717101

Email: [info@wbs-ltd.co.uk](mailto:info@wbs-ltd.co.uk) Web: [www.wbs-ltd.co.uk](http://www.wbs-ltd.co.uk)

- **System Reference: Wetherby Epsiwall External Wall Insulation System.**



- **Insulation: WBS Enhanced EPS Insulation Boards.**

- Thickness: 90mm.
- Board Size: 1200 x 600mm.
- Density: 15 Kg/m<sup>3</sup>.
- Minimum Compressive Strength: 70 KN/m<sup>2</sup>.
- Thermal Conductivity: 0.032 Wm<sup>2</sup>/K.
- Performance in Relation to Fire:
  - Flame Retardant Grade.
  - Class E (BS EN 13501-1:2002)
- Environmental:
  - CFC / HCFC Free.
  - Zero ODP.
  - GWP Less Than 5.



- **Fixing: Mechanical Only.**
  - Insulation Adhesive: N/A.
  - Fixing Type: TFIX-8M x 155mm (subject to pull out tests).
  - Fixings must achieve a minimum pull out of 0.7kN. Higher pull out test results may be required depending on the project type and location.
  
- **Insulation to Reveals: TBC.**
  - Thickness: TBC.
  - Fixing: TBC.
  
- **Below DPC.**
  - Insulation Type: HD EPS Insulation Board
  - Thickness: 80mm.
  - Fixing Type: TFIX-8M x 135mm.
  - Below DPC Insulation to terminate 10mm from ground level.
  - Wetherby Starter Track Ref: WBS 9149 (90609) 90mm Aluminium Base Rail with WBS 37400 Profile Clip.
  - Bedding Coat: Wetherbycoat brush applied at 2mm to bottom of basetrack, substrate and bottom of insulation board.
  - Reinforcing Coat: WBS Scrim Adhesive applied 6-8mm and reinforced with alkali resistant glass fibre reinforcing mesh.
  - Decorative Finish: Bitumen Paint.
  
- **Movement Joints: As Per Drawings.**
  - Vertical Movement Joint Ref: WBS MJ6 Movement Joint.
  - Horizontal Movement Joint Ref: WBS RCJT & RCJB Horizontal Compression Joint.
  - Movement joints must be used to replicate any structural movement joints in the existing substrate as per site survey / Structural Engineers report.
  - All beads must be fully meshed in.
  
- **Fire Breaks: TBC.**
  - Firebreaks are required on all projects 2 storeys and above including party walls as per BRE Report BR135:2013.
  - Firebreak positioning to be confirmed by Local Building Control.
  
- **Reinforcement: WBS Alkali Resistant Scrim Cloth incorporated into top third of the WBS Heck K&A Scrim Adhesive.**
  - Reinforcement Adhesive: WBS Heck K&A Scrim Adhesive.
  - Secondary Fixing: TBC.
  - Fixing Type: TBC.
  - Secondary mechanical fixings are required on all projects 2 storeys and above as per BRE Report BR135:2013.
  - NHBC require in all cases that a minimum of one non-combustible fixing is installed through the reinforcement mesh per insulation board, in addition to other fixings.

- Secondary fixing requirements to be confirmed by local building control.
  
- **Decorative Finish.**
  - Wetherby Primer: Solvent free pigmented bonding primer in a colour to match the finish coat.
  - Wetherby Finish Coat: HECK 4S Silicone 'K' 1.5mm Textured Finish.
  - Colour: TBC.
  
- Additional Coating (Optional).
  - Wetherby Aspira Render Protector: Apply one clear coat of Aspira Render Protector.
  
- **Beads / Trims / Accessories.**
  - Full System Beads / Trims:
    - Wetherby Starter Track Ref: WBS 9149 (90609) 90mm Aluminium Base Rail with WBS 37400 Profile Clip.
    - Wetherby Full Depth Stop Bead Ref: WBS 9249 (93309) 90mm Aluminium Full System Stop Profile.
    - Mechanical Fixing: WBS HIT 6/5 Hammerscrew Bead Fixing.
    - Wetherby Cills: Type TBC.
    - Aluminium Overcill (if required)
    - Wetherby Aluminium Overcills. All cills shall be site measured and supplied with welded end caps to suit the application.
    - Aluminium Undercill Extenders (if required)
    - Wetherby Aluminium Undercill Ref: 731/115 140mm Aluminium Undercill.
    - All cills and flashings must provide a minimum 40mm overhang to protect the Wetherby System.
  - Surface Render System Beads:
    - Wetherby Corner Bead Ref: WBS 3707 PVC Corner Bead.
    - Wetherby Render Bellcast Bead Ref: WBS B10 PVC Bellcast Bead.
    - Wetherby Render Stop Bead Ref: WBS RS6 PVC Stop Bead.
    - Wetherby Vertical Movement Joint Ref: WBS MJ6 PVC Movement Joint.
    - Wetherby Horizontal Movement Joint Ref: RCJT & RCJB Horizontal Compression Joint.
    - Wetherby APU Frame Seal Ref: WBS APU 37909 PVC Frame Seal.
  
- **Accessories:**
  - WBS Sealing Tape: Pre-compressed, expanding waterproof sealing tape.
  - WBS Firtree Fixings.
  - WBS Jointing Pieces.
  - WBS End Caps.
  - WBS Approved Silicone Sealant.

**310 DESIGN**

- Complete the detailed design of system and associated features shown on drawings: Complete to meet requirements of this specification. Refer to Wetherby detail drawings.
- Please note all compliance needed to meet Building and Fire Regulations is the responsibility of the principle designer/ main contractor.
- Detailing of system junctions & ancillary items are to be agreed by all parties.

**320 INTEGRITY**

- Installation Requirements:
  - Weathertight under all anticipated conditions.
  - Capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodating all thermal movements without damage.

**330 IMPACT LOADING**

- Impact Resistance of Finished Walls: Resistance to hard body impacts (3 joules to 10 joules) and to perforation.

**340 WIND LOADING**

- Design Wind Loads: The system shall be designed to withstand all design wind loads.

**360 SAMPLES**

- Procedure: Submit samples / examples of designated items for approval. Keep approved samples on site for the duration of the contract for inspection / comparison purposes.
- Designated items: Textured sample of Wetherby Silicone Finish.

**370 UNIFORMITY OF COLOUR AND TEXTURE**

- Type / proportion of constituent materials: Unchanged once samples of coatings have been approved.
- Supplies of materials: Sufficient to give consistent and uniform colour and texture.
- All materials shall be manufactured and supplied in accordance with BS EN ISO 9001: 2008.
- WBS renders and mortars are pre-blended during the manufacturing process by the supplier, although care should be taken to ensure colour uniformity between individual batches of material.

**380 LIGHTNESS**

- It is advised that Silicone Textured Render Systems for application over insulated render backgrounds shall be selected in colour(s) with a lightness factor of >20. Should the lightness factor of the selected colour(s) be <20, please contact the Wetherby Technical Support Team for further information.



### 390 AVOIDANCE OF COLOUR SHADING

- To minimise the risk of variations in colour shade and to avoid dry line jointing, decorative finishes should be applied continuously without a break.
- Where breaks are unavoidable, they should be made where services or architectural features such as the lines of doors, windows, reveals or drainpipes help to conceal the position of the joint. Surface render beads can be used to provide a clean break in the render.
- Material sharing the same batch number should be used to complete an entire elevation where possible.
- Material with different batch numbers should be checked for colour consistency.

### 410A INSTALLATION

- Installer: The system shall be installed by a specialist contractor approved for the project by Wetherby Building Systems.

### 415A EPSIWALL PAS2030:2019 SYSTEM APPLICATION

#### Base Bead

Securely fix Wetherby starter track with profile clip above DPC level at base of the system. Mechanically fix starter track at max. 300mm centres, 50mm from each end. WBS 3756 base rail connectors should be used to join the tracks, packing shims may be required to ensure the starter track is true to line and level. Any gaps behind the basetrack allowing free air movement behind the insulation should be sealed appropriately.

#### Full System Stop Bead

Securely fix Wetherby full system stop beads on WBS Sealing Tape to the extent of the system and its abutment to untreated areas i.e. meter boxes, rising service supplies or any other untreated abutment. Stop beads are to be fixed at max. 300mm centres, 50mm from each end. **A continuous** bead of WBS Approved Silicone Sealant must be applied to seal the stop bead to the substrate.

#### Roof Detail

Where the existing roof does not provide an adequate overhang to the EWI system (minimum 40mm), a specialist roofing profile must be sought to provide adequate protection. Alternatively, the roof must be extended as necessary to provide overhang to the EWI system.

To reduce cold bridging, the existing soffit board may need to be removed and the system taken up the entire wall to ensure continuity with loft insulation. It is critical that any ventilation is maintained. Please see Wetherby PAS 2030:2019 detail drawings for further information.

#### Cills

Securely fix cills, ensuring they are secure and provide a water tight detail to protect the EWI system. Apply WBS sealing tape and WBS Approved Silicone Sealant as per Wetherby PAS2030:2019 detail drawings.



### WBS Insulation Bedding Adhesive (where required)

Bedding adhesive may be required to level the insulation boards on applications to uneven substrates. WBS Bedding Adhesive should be applied in a continuous line around the perimeter of the board with 3 additional dabs of adhesive distributed uniformly over the remaining surface. At least 40% of the board should be covered. The boards should be fully bedded into the adhesive and a mechanical fixing installed through the centre of each board to hold in place whilst the adhesive dries. Alternatively, apply WBS Insulation Bedding Adhesive to the entire face of the insulation boards using a 10mm minimum notched trowel ensuring a full spread of adhesive.

### Application of Enhanced EPS Insulation Boards

Position and securely fix the Enhanced EPS insulation boards to the substrate. The boards should be tightly butt jointed, laid with staggered joints and overlapped at building corners. Board joints should not occur within 200mm of the corners of openings. Board pieces narrower than 200mm shall not be used. Any lips / high spots in the insulation boards should be rasped smooth. Where the insulation butts up against dissimilar materials, supply and install WBS Sealing Tape and ensure the boards are fitted tight against the seal, ensuring full compression of the tape.

N.B. thinner insulation may be required in passageways and to window reveals.



### Fixing Of Insulation Boards

Fix boards mechanically to the substrate using approved WBS fixings at a rate of 8 - 9 per m<sup>2</sup> in accordance with WBS fixing pattern (fixing pattern located at the back of this document subject to pull-out / wind load calculations). Fixings shall be installed so that the fixing head embeds 1-2mm in to the face of the insulation board surface. Additional fixings should be installed to ensure a maximum of 300mm centres at either side of building corners and around all openings.

### Movement Bead / Slip Joints

Fix movement beads / slip joints at agreed locations using WBS approved fixings. Structural movement joints must be mirrored through the EWl system.

### Surface Mounted Render Beads

Fix surface mounted render beads directly to the insulation board at required locations using WBS Firtree Fixings. A continuous bead of WBS Approved Silicone Sealant must be applied to seal the surface mounted render stop beads.

### Existing Air Vents, Grilles etc.

Identify live or used air vents, grilles etc. and extend through the insulation system as work progresses.

### APU Beads

Install APU beads around openings where required in accordance with Wetherby PAS 2030:2019 detail drawings. Beads must be applied to a clean surface to ensure optimum adhesion.

### PVC Angle Bead

Fix by bedding into first pass of scrim adhesive, PVC angle beads with glassfibre mesh reference WBS 3707 to all external building corners, window / door jambs and heads.

### Alkali Resistant Glassfibre Scrim Coat

Trowel apply a 4-6mm thick coat of scrim adhesive to the entire surface of the insulation boards. Lightly run a notched trowel through the scrim adhesive at a 45 degree angle to ensure the correct thickness of adhesive is applied. Bed WBS Alkali Resistant Scrim Cloth into top third of the wet adhesive, overlapping joints by 75mm minimum. The scrim cloth must be overlapped around building corners and returned into all reveals and heads. All beads must be fully scrimmed in. Install additional 250mm x 300mm minimum pieces of scrim cloth diagonally across corners of all wall openings.

Finally smooth out scrim adhesive using a spatula.



### Scrim Adhesive Coat (Second Application)

When initial layer of scrim adhesive has hardened, trowel apply a further 2-3mm coat of scrim adhesive ensuring all alkali resistant mesh is covered. Level the scrim adhesive using a spatula / damp sponge float to achieve a uniform flat and even surface ready to receive the WBS final finish.

Allow sufficient drying time before applying the Primer. Cold conditions and high humidity will result in the basecoat taking longer to dry / cure. The basecoat must be fully hardened with no signs of moisture visible. Moisture trapped in the basecoat can potentially damage the curing of the Primer / Silicone Render causing failure after completion of the system.

### Silicone Primer

Apply Wetherby Primer with a brush or lamb's wool roller as per manufacturer's printed instructions. Allow Primer to fully dry, minimum 12 hours.

### Silicone Render Finish

Mix and apply Wetherby Silicone Textured Finish strictly in accordance with the manufacturer's printed instructions. The top coat should be applied with a stainless steel trowel to the thickness of the grain and finished with a plastic float. Apply in a continuous application always working to a wet edge and in the same direction to ensure consistency of finish. Wherever possible, entire elevations should be completed in a single operation to avoid joint marks in the finish. This can often be achieved by working to natural breaks in the building or working to breaks in colour or texture.

Do not apply Wetherby Silicone Textured Finish with differing batch numbers on the same elevation. Care should be taken to avoid texture changes at different levels. Prior to setting, polish render with plastic float to give an even texture and remove all trowel marks.



### Silicone Sealant

Gun apply a continuous bead of WBS Approved Silicone Sealant at points where the renders will butt up against other materials, e.g. window frames, door frames, eaves, fascia's, projecting wall vents, gas and electric meter boxes etc. ensuring water tightness. Always ensure the surface to be sealed against is clean and free of dust to allow optimum adhesion. Silicone Sealant to be installed as per PAS2030:2019 detailed drawings.

### FID Fixings

Install FID fixings through insulation to install lightweight fixtures to the Insulation and Render.

### SWI-FIX / Approved Fixings

Install SWI-FIX washer and suitable fixing to be used to fix back items such as RWP's, lights, handrails etc.



### **Below DPC System Installation**

Please refer to the Wetherbycoat below DPC application guide and Wetherby PAS 2030:2019 Detail Drawings.

### **Aspira Render Protector (Optional)**

Apply Wetherby Aspira Render Protector with a roller ensuring a full and even coverage, covering 100% of the substrate. The substrate must be fully dry and clean before application; ensuring morning dew is not present on the substrate. Cross hatch application is recommended to ensure all areas are fully treated. Do not dilute product and protect from rain for a minimum 12 hours after application to allow coating to fully dry.

### **Cleaning**

Wipe clean all exposed PVC nosing, cills etc., at each work stage whilst render is still wet.

### **Application Videos**

Wetherby have detailed application videos available online, please see <http://www.wbs-ltd.co.uk/videos/>.

## **420 ADVERSE WEATHER**

Materials / Surfaces: Do not use frozen materials and do not apply materials to frost bound substrates.

Adhesives / Mortars / Renders: Do not apply when air temperature is at or below 5°C. Render products may be applied where temperatures are above 3°C on a rising thermometer and are forecast to stay above 5°C for an extended period on the same day.

- Adhesives / Mortars / Renders: Do not apply when relative humidity is equal to or greater than 90%.
- Do not apply materials when the air temperature or wall surface is in excess of 30°C without protection of the surface.
- Temperature of the work: Maintained above minimum level recommended by manufacturer until adhesive / mortar / render has fully hardened.
- Drying Times: Drying times of decorative finishes, particularly pre-mixed water based materials, may be greatly extended during periods of low temperature and / or high relative humidity 90% and above.
- Newly rendered surfaces: Protect newly rendered surfaces against rain, snow or other precipitation. Ensure that material is protected from frost, wash-offs etc.
- Application of renders, mortars or decorative finishes shall not be carried out on elevations where summer strength sunlight is hitting the area square on for prolonged periods without affording protection.
- Coatings damaged by rain or frost: Remove and replace.



**440 ON SITE PULL OUT TESTS ON FIXING PINS**

- Objective: To prove suitability of structural substrate and determine size and number of fixings required.

**490 CONSTRUCTION / MOVEMENT JOINTS / SLIP JOINTS**

- Location: As shown on drawings.
- Formation: Accurately to detail.
- Modifications to joint locations / design: Agree revisions before proceeding.
- All structural movement joints must be mirrored through the EWI system.

**500 FLUES, CHIMNEYS AND COMBUSTION AIR VENTILATORS**

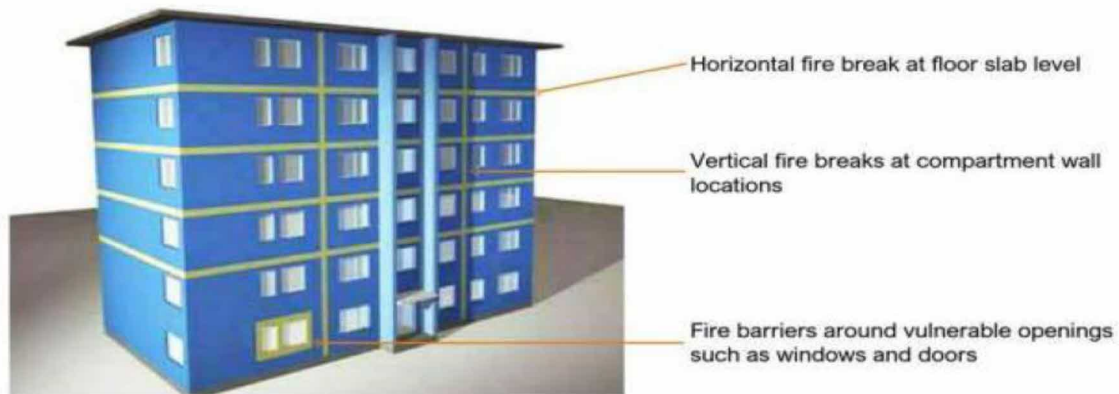
- The combustion air supply must be isolated and air ventilator continuously sleeved through the wall.
- Under PAS 2030:2019, both installer and Retrofit Designer have strict responsibilities placed upon them when it comes to the identification and safeguarding of essential ventilation requirements. Please refer to the PAS2030:2019 Fuel Burning Appliances Document for further information.

With regards to gas flues there are two methods of installation, either a clear gap is left around the flue (300mm for fanned draught flues / 600mm for natural draught flues) or a 200mm non-combustible insulation slab installed around an extended flue. While Wetherby include both alternatives in the detail drawings, main contractors and installers must ensure the chosen method is approved in conjunction with the boiler manufacturer's specification.

**510 FIRE BARRIERS**

- Material: Non-combustible to BS 476-4.
- Size (minimum): 1200mm x 200mm.
- Installation: At every floor level above and including the second floor and vertically at party walls as advised in BRE Report BR135:2013.
- Further fire barrier requirements: Subject to project specific requirements & to be confirmed by Principal Designer/ local Building Control.
- Fixing: Adhesively and mechanically back to substrate. Closely butted at joints and intersections with no gaps.
- Dub out: Fire barrier to be 10mm less than main insulant and dubbed out to main insulant with double mesh to prevent shadowing and cracking.

Image taken from the INCA Guidance Document 01 – Fire Performance and Requirements for EWI systems (May 2021).



*Typical example of fire break and fire barrier locations*

Image taken from the INCA Guidance Document 01 – Fire Performance and Requirements for EWI systems (May 2021).

#### **515 LIGHTNING CONDUCTOR**

- Should be relocated to the surface of the system or fix Stone Wool insulation strip around the lightning conductor. Notch the back of the insulation board to allow for movement of lightning conductor leaving a 10mm gap as per Wetherby detail drawing.

#### **520 SUPPORTS FOR SERVICES / FITTINGS**

- Supports for soil and rainwater pipes, signs, CCTV cameras etc: Provide in locations shown on the drawings.
- Type: timber pattresses same thickness as the insulation, fixed back to the load-bearing background using proprietary countersunk stainless steel screws or other non-corrodible fixings. Timber pattress to be no more than 200mm x 200mm.
- No load is to be transferred to the insulated render system.
- Alternatively, sleeved fixings shall be installed into the load-bearing background after completion of the render works in accordance with Wetherby recommendations.

#### **528 EXTERNAL POWER CABLES**

- External power cables must not be covered over by the EWI system or cover plates in any circumstances. Power cables must be relocated, left open and visible or suitably & safely enclosed with guidance from the power distribution authority.

#### **530 SEALANT JOINTS**

- Sealant: WBS Approved Silicone Sealant.
- Joints: Formed in accordance with section Z22 and system manufacturer's recommendations using any necessary joint fillers, backing strips etc.
- Sealant should be regularly checked and replaced as required. Sealant is not covered as part of the Wetherby system warranty.

**540 STORAGE OF MATERIALS**

- Adequate dry weatherproof and ventilated storage shall be provided for materials.
- All materials shall be protected against frost.
- Insulation boards must be kept dry at all times.
- Cementitious products shall be stored off the floor.
- Renders to be stored in temperatures of at least 5°C.
- Materials should be protected from prolonged exposure to sunlight.

**550 INSPECTION OF COMPLETED INSTALLATION**

- Timing: As soon as possible after completion of the work and before removing scaffolding.
- Notice for inspection (minimum): 7 working days.
- Defects: Report immediately.

**570 MATERIALS AND SITE CONDITIONS**

- All materials shall be provided for the proper and efficient execution and completion of the works.
- Materials shall be mixed, applied and fixed in accordance with the relevant clauses of the specification and the manufacturer's instructions.
- A clean, fresh supply of water shall be provided for the works, via the management contractor.
- Suitable scaffolding that has a minimum gap of 300mm (all scaffold items) from the elevation surface in order to facilitate application requirements, shall be provided, erected, maintained and later removed for the proper and efficient execution and completion of the works.
- All necessary temporary supports for drains, water pipes, gas pipes, electrical cables and telephone cables shall be provided and maintained until the permanent supports are reinstated.
- Temporary flexible tubing shall be provided for the efficient discharge of rainwater from the buildings to protect the system during the progress of the works.

**580 CLEANLINESS OF WORKS**

- Protect all existing works, approaches and adjacent surfaces including windows and doors etc. using suitable sheeting, boards, covers etc.
- Remove all splashes, droppings etc. from completed works immediately and before drying takes place.

**590 CONTROL OF POLLUTION**

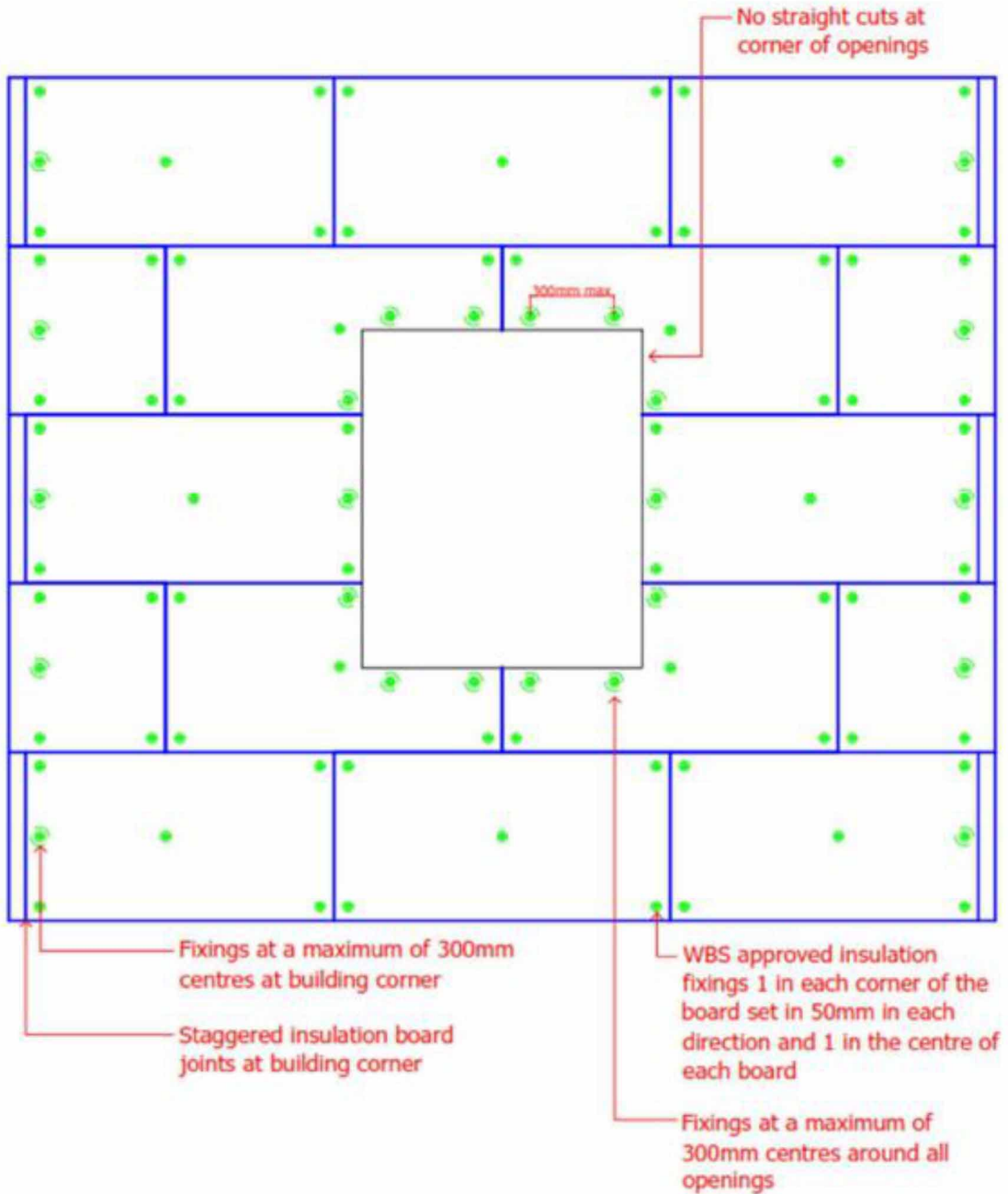
All debris and rubbish arising from the works shall be removed off site from time to time to keep the site and works clean and tidy. All measures shall be taken to control the noise levels produced by the operatives on site to comply with the Control of Pollution Act. Precautions should be taken to prevent pollution of any river watercourse, reservoir, drainage or the like by the operatives on site.



**600 MAINTENANCE**

- **An initial inspection should be made within 12 months and regularly thereafter to include:**
  - visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired. Impact damage must be repaired to prevent moisture ingress into the system.
  - visual inspection of architectural details designed to shed water to confirm that they are performing properly.
  - visual inspection to ensure that water is not leaking from external downpipes or gutters, as such leakage could stain or penetrate the rendering.
  - Sealant joints at window and door frames, etc which must be replaced as required. Sealant is not covered as part of the Wetherby warranty.
  - Maintenance schedules must be created and maintained for the building, which should include any repairs undertaken and the replacement and resealing of joints (for example, between the insulation system and window and door frame).
  - The render may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas and can be removed simply with a biocidal wash.
  - Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1: 2005. Please see Wetherby High Rise O&M Manual and Wetherby High Rise Maintenance Information for further details.

Wetherby EWI Fixing Pattern (Subject to Pull Out Tests & Wind-Load Calculations)



## Render Only System to Porches

### Project Specification

Project Name: 11-18 Mosley Crescent, Stroud

System: Wetherby HECK 4S Silicone 'K' 1.5mm Render System Substrate: Project Height:

Existing Render on Masonry 2 Storeys

System Finish: WBS HECK 4S Silicone 'K' 1.5mm Textured Finish

Technical Sales Manager: [REDACTED]

Technical Support Manager: [REDACTED]

### WETHERBY BUILDING SYSTEMS

Wetherby Buildings Systems are the UK's market leading EWI system supplier, providing quality products and systems and unrivalled technical and on-site project support. We aim to provide environmentally responsible and sustainable building products of the highest quality, continually improving on our quality and system accreditations to ensure that optimum standards are met.

### WETHERBY PREMIUM CERTIFIED PRODUCTS

Wetherby Buildings Systems products and EWI systems are tested to the highest level with an unrivalled range of BBA, BDA and ETA certificates available for use on projects in the UK. All testing achieves the highest European standards, ensuring long term durability, strength and premium performance. BBA/BDA approved systems provide a minimum life expectancy of 30 years. BRE Fire Certification has also been achieved for a large number of systems, with certain certification extending to 60-year life expectancy.

### UK MANUFACTURING

Here at Wetherby, we take our responsibility to 'Buy British' extremely seriously. All of our current and potential suppliers undergo a rigorous annual assessment. Each supplier is reviewed over a number of areas including responsible procurement, product suitability, commitment to sustainability, quality etc. Only when we are completely satisfied are they included on our Supply Chain Database.



## ISO 9001, ISO 14001, & ISO 45001

### **Wetherby Building Systems have a strong pro-active approach to internal Quality Systems, Environmental Management Systems and Health and Safety.**

Our ISO Integrated System is regularly audited internally by qualified auditors and annually by independent external auditors, Alcumus ISOQAR. This ensures consistency in the supply and quality of our materials and services, and our environmental responsibilities and targets which we take very seriously. This includes our ongoing commitment to recycle, re-use, reduce GHG's and improve products and systems alongside our partners and suppliers. The main aim is to maximise sustainability for all products and systems across our extensive range. We have a strong pro-active approach to Health and Safety. We manage all risks associated with our activities by regularly monitoring our premises, revising Risk assessments, Safe Systems of work, and Method Statements when required. We strive to provide the best training, support, and management on all our projects providing knowledge and experience throughout the task being undertaken.

### **TECHNICAL SERVICES**

Wetherby offer a wide range of technical services to support project design and system installation. In depth NBS Specifications, project specific CAD drawings, photographic overlays, U-values and condensation / humidity risk analysis documents are all readily available via our Technical Support Team. For Technical Enquires please contact on 0800 1073299 or [technical@wbs-ltd.co.uk](mailto:technical@wbs-ltd.co.uk)

### **TRAINING SERVICES AND TRAINED APPLICATORS**

We provide a variety of in-depth training courses, covering all systems, to ensure that installations are completed to the highest possible standards.

For training enquires please contact: [REDACTED]

For information on our Trained Applicators please contact your Area Sales Manager as per details on page 2 of this specification.

### **SITE SUPPORT, PULL OUT TESTS AND INSPECTIONS**

Wetherby Building Systems offer unrivalled site support for EWI projects with 8 Site Supervisors strategically positioned across the UK. Pull out testing, product information, detailing advice and application assistance are all available from our experienced team.

### **SAMPLE SERVICE**

We provide a FREE sample service for all of our products and systems.

To access this service, contact our sample department on 0800 1073288 or alternatively e-mail [REDACTED] who will be more than happy to assist you with your enquiry: [REDACTED]@wbs-ltd.co.uk

## **GUARANTEES**

Wetherby can provide a guarantee covering defects in materials on Wetherby BBA / BDA / ETA approved EWI systems installed by Wetherby recognised contractors, for the first 10 years of the system lifespan\*. Extended guarantees are available for government backed schemes provided by carefully selected third party insurance partners such as SWIGA and GDGC\*. Please contact Wetherby for further information/ requirements for render only guarantees. (\*conditions apply)

## **CDM REGULATIONS 2015**

Wetherby Building Systems provide technical support as a supplier of façade systems and we hold the position of 'designers' according to the CDM Regulations 2015.

Wetherby have a number of legal responsibilities in this role when preparing or modifying designs, to eliminate, reduce or control foreseeable risks that may arise during construction, maintenance and use of a building once built. We are also obligated to provide timely information to other members of the project team to help them fulfil their duties.

Further information is contained in our CDM document (WF224) which is applicable to all designs and is available on our web site ([www.wbs-ltd.co.uk/xpagex](http://www.wbs-ltd.co.uk/xpagex)) or on request

## **WETHERBY 4S SILICONE RENDER SPECIFICATION**

### **M20**

Plastered / Rendered / Roughcast Coatings

To be read with Preliminaries/General Conditions.

This specification is valid for 6 months from issue date, due to the changing industry regulations and requirements. For an updated version of the specification please contact the relevant technical sales manager.

This specification is specifically for the named project and is not transferable to other projects, projects require specific custom specifications, please contact Wetherby Technical departments for further information.

## **GENERAL / SYSTEM REQUIREMENTS**

### **120 SURVEY OF EXISTING WALLS**

- Timing: Before starting work covered in this section.
- Objective: To confirm suitability for application of WBS Renders.
- Survey report: Submit, covering all relevant matters listed below:
  - The exact type of substrate and condition of the structural substrate.
  - A schedule of repairs and / or additional works necessary to ensure the substrate is suitable to receive the render system, to be completed prior to rendering.
  - A schedule of services, fixtures and fittings requiring removal to facilitate installation of the system.

- Remove existing rainwater pipes and re-direct away from work surface whilst work proceeds. Ensure all rainwater from the roof area is carried away from the work area by means of temporary fixed rainwater goods.
- Position and condition of DPC, ensuring it is correctly functioning.
- Any damp in the substrate or frost damage which must be rectified prior to the render being applied.
- Condition of any existing paint and removal if required.
- Any other information considered relevant.

### 130 REMEDIAL WORK

- Remedial work shown to be necessary by survey: Employer's responsibility.

### 150 STRUCTURAL SUBSTRATE

- **Description: Existing Render on Masonry.**
- **Preparation:**

- Treatment to Existing Sound Surfaces.

All repairs must be completed prior to rendering, ensuring the substrate is dry (no damp) and is in a suitable condition for the render application.

- Remove any existing loose material and where required dub out the surface level, ready to receive the Wetherby render system. The existing walls are to be cleaned with a wire brush or pressure jet wash, to the satisfaction of the Contract Administrator, to remove any friable material, algae or lichen, and to provide a good key for Wetherby products. Treat areas of moss, algae and mould growth with WBS Biocidal Wash.

- Dubbing Out

Where necessary dub out, using Wetherby Dubbing Render, any hollow / defective areas to leave a suitable surface for the application of the Wetherby renders. Maximum dubbing coat thickness: 16mm.

- Biocidal Wash

Where required, apply one coat of Wetherby Biocidal Wash to the entire surface by roller or knapsack spray and allow to dry. Brush the surface to remove all signs of growth before rendering commences.

- Contact Primer

Required on any painted substrate, dense / smooth substrates and blockwork with less than 7kN density to improve adhesion. Apply liberally and evenly by roller to give a uniform textured finish. Contact Primer must be left to cure for minimum 16 hours before commencing rendering.

Please refer to the Wetherby Render Only Rules Document (WF-RO-21) for further information.



## 160A EXTERNAL WALL RENDER SYSTEM

- **Manufacturer:**

Wetherby Building Systems Ltd.

1 Kid Glove Road Golborne Enterprise Park Golborne

Greater Manchester WA3 3GS

Tel: 01942 717100

Fax: 01942 717101

Email: [info@wbs-ltd.co.uk](mailto:info@wbs-ltd.co.uk) Web: [www.wbs-ltd.co.uk](http://www.wbs-ltd.co.uk)

- System Reference: Wetherby HECK 4S Silicone K 1.5mm Render System.



- Reinforcement: WBS Alkali Resistant Scrim Cloth incorporated into top third of the WBS Heck K+A Scrim Adhesive.
- Reinforcement Adhesive: WBS Heck K+A Scrim Adhesive.

### **Mechanical Fixing: ISO 10/30 x 60mm.**

- Fixing to be installed through wet WBS Heck K+A Scrim Adhesive and WBS Alkali Resistant Scrim Cloth at a rate of 1 per m<sup>2</sup>.
- Painted substrates require 2 fixings installed through the mesh per m<sup>2</sup>.
- Fixing type, length and frequency subject to pull out tests.

- **Movement Joints: As Per Drawings.**

- Movement Joint Ref: WBS MJ10 Movement Joint.
- Movement joints must be used to replicate any structural movement joints in the existing substrate as per site survey / Structural Engineers report. A change in substrate will also require a movement joint.

- **Decorative Finish.**

- **Wetherby Primer: Solvent free pigmented bonding primer in a colour to match the finish coat.**
- **Wetherby Finish Coat: Heck 4S Silicone 'K' 1.5mm Textured Finish.**
- **Colour: TBC.**

- **Beads / Trims / Accessories.**

- Full System Beads / Trims:
- Wetherby Verge Trim: WBS 741/50 50mm Powder Coated Galv. Verge Trim.
- Mechanical Fixing: WBS HIT 6/5 Hammerscrew Bead Fixing.
- Wetherby Cills: Type TBC.
- Aluminium Overcill Extenders (if required) – Option 1\*

Wetherby Aluminium Overcills. All cills shall be site measured (ensuring a minimum 40mm overhang) and supplied with welded end caps to suit the application.

- PVC Overcill Cappit Extenders (if required) – Option 2\*

Wetherby PVC Overcills. All cills shall be site measured (ensuring a minimum 40mm overhang) and supplied with end caps to suit the application.

- Aluminium Undercill Extenders (if required) – Option 3\*

Wetherby Aluminium Undercill Ref: 731/25 50mm Aluminium Undercill. NOTE: Contract Administrator to advise which option is preferred

### **Surface Render System Beads:**

- Wetherby Corner Bead Ref: WBS 3707 PVC Corner Bead.
- Wetherby Render Bellcast Bead Ref: WBS B10 PVC Bellcast Bead.
- Wetherby Render Stop Bead Ref: WBS RS10 PVC Stop Bead.
- Wetherby Movement Joint Ref: WBS MJ10 PVC Movement Joint.
- Wetherby APU Frame Seal Ref: WBS APU 37909 PVC Frame Seal.

- **Accessories:**

- WBS Jointing Pieces.
- WBS End Caps.
- WBS Approved Silicone Sealant.

### **310 DESIGN**

- Complete the detailed design of system and associated features shown on drawings: Complete to meet requirements of this specification. Refer to Wetherby detail drawings.
- Please note all compliance needed to meet Building and Fire Regulations is the responsibility of the principle designer/ main contractor.
- Detailing of system junctions & ancillary items are to be agreed by all parties.

### **320 INTEGRITY**

- **Installation Requirements:**
  - Weathertight under all anticipated conditions.
  - Capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodating all thermal movements without damage.

### **330 IMPACT LOADING**

- Impact Resistance of Finished Walls: Resistance to hard body impacts (3 joules to 10 joules) and to perforation.

### **340 WIND LOADING**

- Design Wind Loads: The system shall be designed to withstand all design wind loads.

### **350 SUITABILITY OF SUBSTRATES**

- Soundness: Free from loose areas and significant cracks and gaps.
- Cutting, chasing, making good, fixing of conduits and services outlets, etc.
- Tolerances: Permitting specified flatness/ regularity of finished coatings.
- Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

### **360 SAMPLES**

- Procedure: Submit samples / examples of designated items for approval. Keep approved samples on site for the duration of the contract for inspection / comparison purposes.
- Designated items: Textured sample of Wetherby Silicone Finish.

### **370 UNIFORMITY OF COLOUR AND TEXTURE**

- Type / proportion of constituent materials: Unchanged once samples of coatings have been approved.
- Supplies of materials: Sufficient to give consistent and uniform colour and texture.
- All materials shall be manufactured and supplied in accordance with BS EN ISO 9001: 2008.



- WBS renders and mortars are pre-blended during the manufacturing process by the supplier, although care should be taken to ensure colour uniformity between individual batches of material.

### **390 AVOIDANCE OF COLOUR SHADING**

- To minimise the risk of variations in colour shade and to avoid dry line jointing, decorative finishes should be applied continuously without a break.
- Where breaks are unavoidable, they should be made where services or architectural features such as the lines of doors, windows, reveals or drainpipes help to conceal the position of the joint. Surface render beads can be used to provide a clean break in the render.
- Material sharing the same batch number should be used to complete an entire elevation where possible.
- Material with different batch numbers should be checked for colour consistency.

### **392 BEADS/STOPS GENERALLY**

- Location: External angles and stop ends except where specified otherwise.
- Corners: Neat mitres at return angles.
- Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
- Beads/ stops for external render: Fix mechanically.
- Finishing: After coatings have been applied, remove surplus material while still wet, from surfaces of beads/ stops exposed to view.

### **395 DUBBING OUT FOR RENDERING**

- General: Correct substrate inaccuracies.
- Thickness of any one coat (maximum): 16 mm.
- Total thickness (maximum): 20 mm, otherwise obtain instructions.
- Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Comb surface of each coat.

### **410A INSTALLATION**

- Installer: The system shall be installed by a specialist contractor approved for the project by Wetherby Building Systems.

## **415A 4S SILICONE RENDER SYSTEM APPLICATION**

### **Bellcast Bead**

Securely fix Wetherby Bellcast bead at base of the system. Mechanically fix starter track at max. 300mm centres, 50mm from each end. The Bellcast bead may need bedding on Wetherby adhesive to ensure it is true to line and level.

### **Render Stop Bead**

Securely fix Wetherby stop beads on a continuous bead of WBS Approved Silicone Sealant to the extent of the system and its abutment to untreated areas i.e. meter boxes, rising service supplies or any other untreated abutment. Stop beads are to be fixed at max. 300mm centres, 50mm from each end.

### **Verge Trim**

Mechanically fix Verge Trim on Wetherby Sealing Tape at the top of the system, ensuring tape is fully compressed. Verge trims are to be fixed at max. 300mm centres, 50mm from each end. Apply WBS Approved Silicone Sealant to the top of the verge to ensure no water ingress is possible.

### **Cills**

Securely fix cills, ensuring they are secure and provide a water tight detail to protect the render system. Apply WBS Approved Silicone Sealant where required.

### **PVC Movement Bead**

Mechanically fix movement beads at agreed locations at 300mm centres and 50mm max from each end. Structural movement joints must be mirrored through the render system.

### **Existing Air Vents, Grilles etc.**

Identify live or used air vents, grilles etc. and ensure they are not obstructed as work progresses.

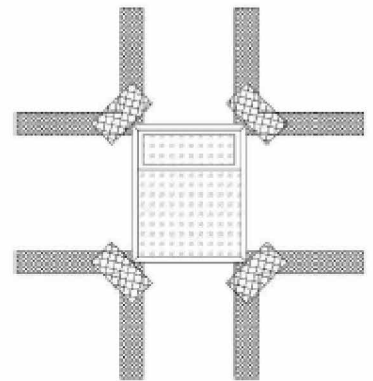
### PVC Angle Bead

Fix by bedding into first pass of scrim adhesive, PVC angle beads with glassfibre mesh reference WBS 3707 to all external building corners, window / door jambs and heads.



### Alkali Resistant Glassfibre Scrim Coat

Trowel apply a 6-8mm minimum coat of scrim adhesive to the entire wall surface. Lightly run a notched trowel through the scrim adhesive at a 45 degree angle to ensure the correct thickness of adhesive is applied. Bed WBS Alkali Resistant Scrim Cloth into top third of the wet adhesive, overlapping joints by 75mm minimum. The scrim cloth must be overlapped around building corners and returned into all reveals and heads. All beads must be fully scrimmed in. Install 200mm x 1000mm stress bandage to all corners of windows and doors with additional 250mm x 500mm minimum pieces of scrim cloth diagonally across corners of all wall openings. Install secondary fixings through the wet scrim adhesive and WBS Alkali Resistant Scrim Cloth whilst adhesive is wet. 100mm x 100mm scrim patches to be installed over each secondary fixing head. Finally smooth out scrim adhesive using a spatula.



### Scrim Adhesive Coat (Second Application)

When initial layer of scrim adhesive has hardened, trowel apply a further 2-3mm coat of scrim adhesive ensuring all alkali resistant mesh is covered. Level the scrim adhesive using a spatula / damp sponge float to achieve a uniform flat and even surface ready to receive the WBS final finish.

Allow sufficient drying time before applying the Primer. Cold conditions and high humidity will result in the basecoat taking longer to dry / cure. The basecoat must be fully hardened with no signs of moisture visible. Moisture trapped in the basecoat can potentially damage the curing of the Primer / 4S Silicone Render causing failure after completion of the system.

### Silicone Primer

Apply Wetherby Primer with a brush or lamb's wool roller as per manufacturer's printed instructions. Allow Primer to fully dry, minimum 12 hours.

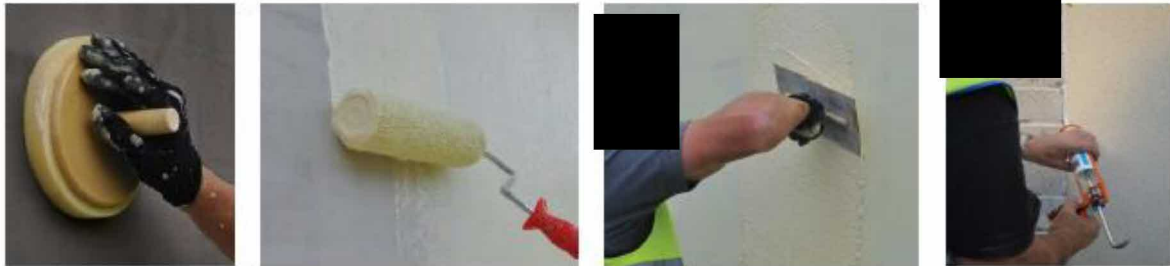
### 4S Silicone Render Finish

Mix and apply Wetherby 4S Silicone Textured Finish strictly in accordance with the manufacturer's printed instructions. The top coat should be applied with a stainless steel trowel to the thickness of the grain and finished with a plastic float. Apply in a continuous application always working to a wet edge



and in the same direction to ensure consistency of finish. Wherever possible, entire elevations should be completed in a single operation to avoid joint marks in the finish. This can often be achieved by working to natural breaks in the building or working to breaks in colour or texture.

Do not apply Wetherby 4S Silicone Textured Finish with differing batch numbers on the same elevation. Care should be taken to avoid texture changes at different levels. Prior to setting, polish render with plastic float to give an even texture and remove all trowel marks.



### Silicone Sealant

Gun apply a continuous bead of WBS Approved Silicone Sealant at points where the renders will butt up against other materials, e.g. window frames, door frames, eaves, fascia's, projecting wall vents, gas and electric meter boxes etc. ensuring water tightness. Surfaces must be clean and suitable for the application of the Silicone Sealant which must be installed as per manufacturers guidance.

### Cleaning

Wipe clean all exposed PVC nosing, cills etc., at each work stage whilst render is still wet.

### Application Videos

Wetherby have detailed application videos available online, please see <http://www.wbs-ltd.co.uk/videos/>.

## 420 ADVERSE WEATHER

- Materials / Surfaces: Do not use frozen materials and do not apply materials to frost bound substrates.
- Adhesives / Mortars / Renders: Do not apply when air temperature is at or below 5°C. Render products may be applied where temperatures are above 3°C on a rising thermometer and are forecast to stay above 5°C for an extended period on the same day.
- Adhesives / Mortars / Renders: Do not apply when relative humidity is equal to or greater than 90%.
- Do not apply materials when the air temperature or wall surface is in excess of 30°C without protection of the surface.
- Temperature of the work: Maintained above minimum level recommended by manufacturer until adhesive / mortar / render has fully hardened.
- Drying Times: Drying times of decorative finishes, particularly pre-mixed water based materials, may be greatly extended during periods of low temperature and / or high relative humidity 90% and above.
- Newly rendered surfaces: Protect newly rendered surfaces against rain, snow or other precipitation. Ensure that material is protected from frost, wash-offs etc.

- Application of renders, mortars or decorative finishes shall not be carried out on elevations where summer strength sunlight is hitting the area square on for prolonged periods without affording protection.
- Coatings damaged by rain or frost: Remove and replace.

#### **440 ON SITE PULL OUT TESTS ON FIXING PINS**

- Objective: To prove suitability of structural substrate and determine size and number of fixings required.

#### **490 CONSTRUCTION / MOVEMENT JOINTS / SLIP JOINTS**

- Location: As shown on drawings.
- Formation: Accurately to detail.
- Modifications to joint locations / design: Agree revisions before proceeding.
- All structural movement joints must be mirrored through the render system.

#### **530 SEALANT JOINTS**

- Sealant: WBS Approved Silicone Sealant.
- Joints: Formed in accordance with section Z22 and system manufacturer's recommendations using any necessary joint fillers, backing strips etc.
- Sealant should be regularly checked and replaced as required. Sealant is not covered as part of the Wetherby system warranty.

#### **540 STORAGE OF MATERIALS**

- Adequate dry weatherproof and ventilated storage shall be provided for materials.
- All materials shall be protected against frost.
- Cementitious products shall be stored off the floor.
- Renders to be stored in temperatures of at least 5°C.
- Materials should be protected from prolonged exposure to sunlight.

#### **550 INSPECTION OF COMPLETED INSTALLATION**

Timing: As soon as possible after completion of the work and before removing scaffolding.

Notice for inspection (minimum): 7 working days.

Defects: Report immediately.

#### **570 MATERIALS AND SITE CONDITIONS**

- All materials shall be provided for the proper and efficient execution and completion of the works.
- Materials shall be mixed, applied and fixed in accordance with the relevant clauses of the specification and the manufacturer's instructions.

- A clean, fresh supply of water shall be provided for the works, via the management contractor.
- Suitable scaffolding that has a minimum gap of 300mm (all scaffold items) from the elevation surface in order to facilitate application requirements, shall be provided, erected, maintained and later removed for the proper and efficient execution and completion of the works.
- All necessary temporary supports for drains, water pipes, gas pipes, electrical cables and telephone cables shall be provided and maintained until the permanent supports are reinstated.
- Temporary flexible tubing shall be provided for the efficient discharge of rainwater from the buildings to protect the system during the progress of the works.

#### **580 CLEANLINESS OF WORKS**

- Protect all existing works, approaches and adjacent surfaces including windows and doors etc. using suitable sheeting, boards, covers etc.
- Remove all splashes, droppings etc. from completed works immediately and before drying takes place.

#### **590 CONTROL OF POLLUTION**

- All debris and rubbish arising from the works shall be removed off site from time to time to keep the site and works clean and tidy. All measures shall be taken to control the noise levels produced by the operatives on site to comply with the Control of Pollution Act. Precautions should be taken to prevent pollution of any river watercourse, reservoir, drainage or the like by the operatives on site.

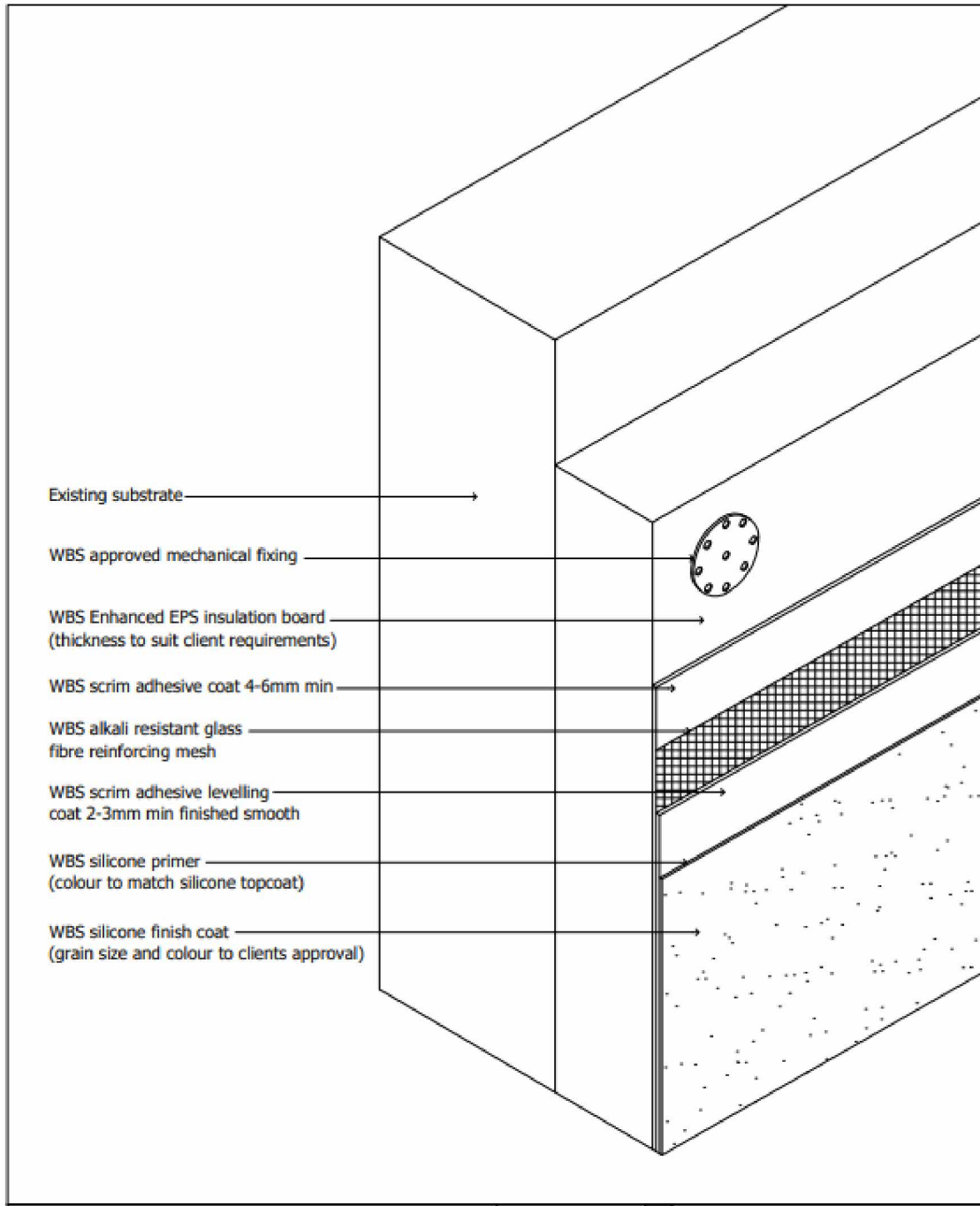
#### **600 MAINTENANCE**

- **An initial inspection should be made within 12 months and regularly thereafter to include:**
  - visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired. Impact damage must be repaired to prevent moisture ingress into the system.
  - visual inspection of architectural details designed to shed water to confirm that they are performing properly.
  - visual inspection to ensure that water is not leaking from external downpipes or gutters, as such leakage could stain or penetrate the rendering.
  - Sealant joints at window and door frames, etc which must be replaced as required. Sealant is not covered as part of the Wetherby warranty.
  - Maintenance schedules must be created and maintained for the building, which should include any repairs undertaken and the replacement and resealing of joints (for example, between the insulation system and window and door frame).
  - The render may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas and can be removed simply with a biocidal wash.
  - Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1: 2005. Please see Wetherby O&M Manual and Wetherby Maintenance Information for further details.

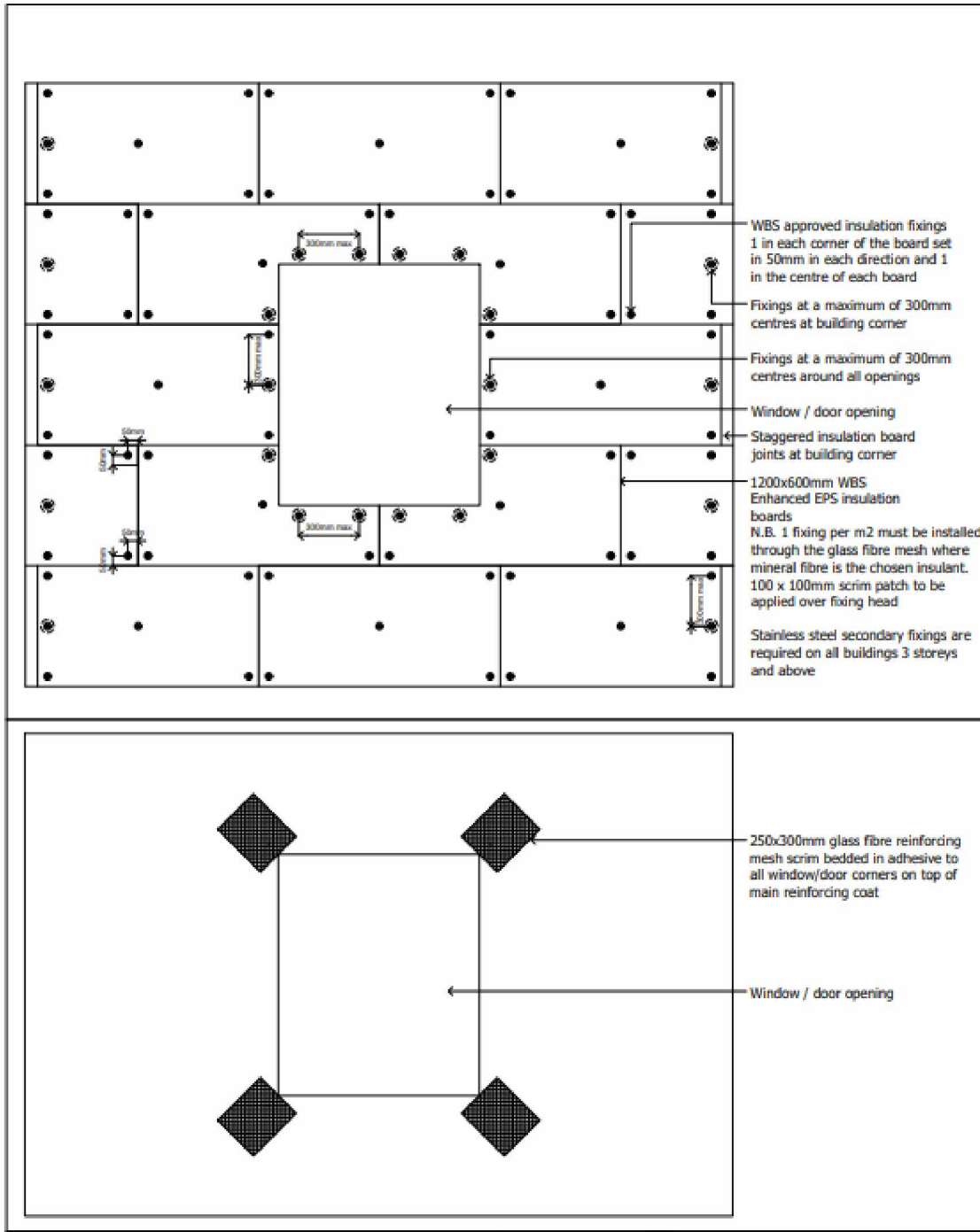


C2.1 EWI Drawings & Details

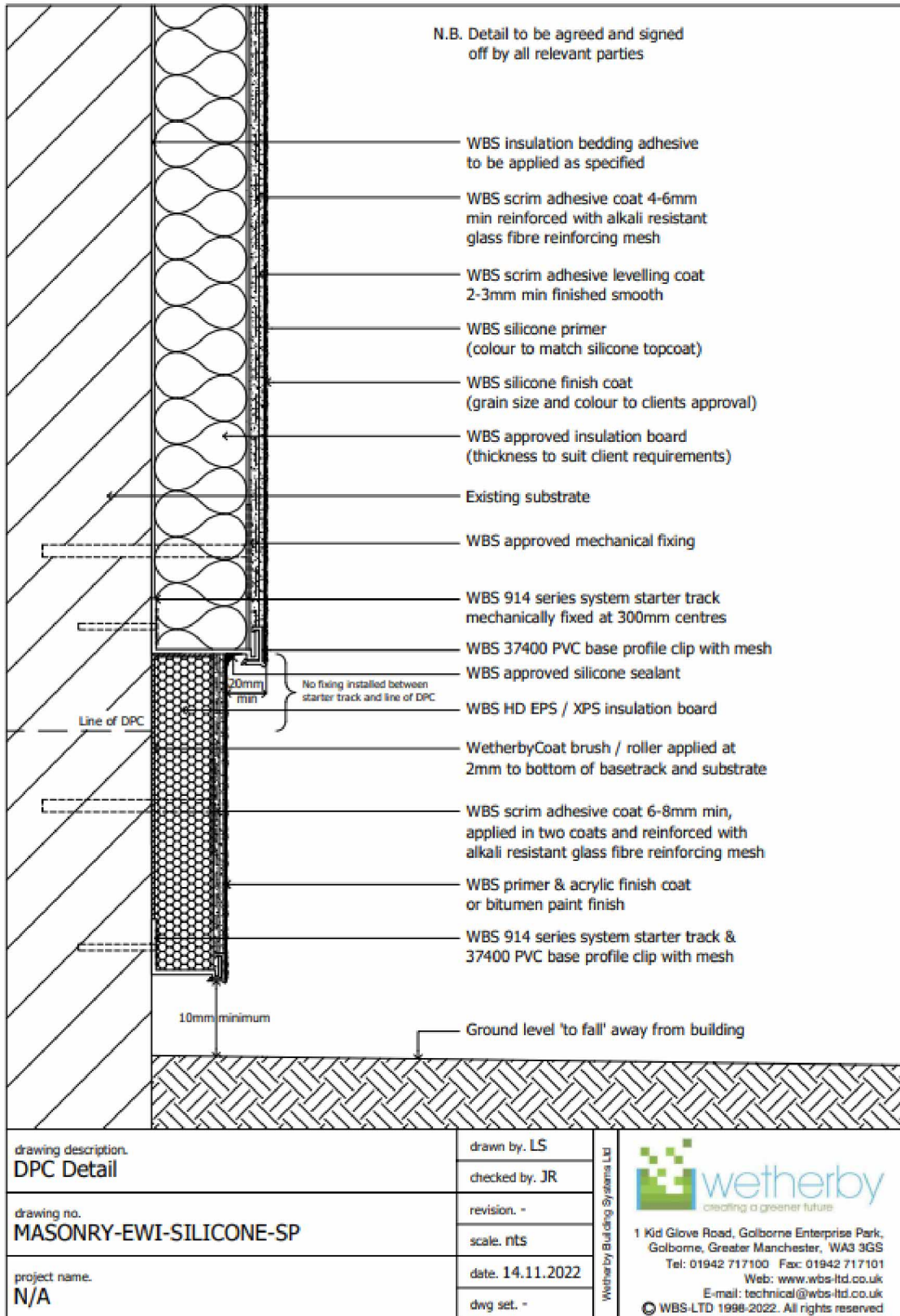
C2.2 Isometric System Build Up Detail based on 90mm WBS Enhanced Insulation Board C



### C2.3 Fixing Arrangement

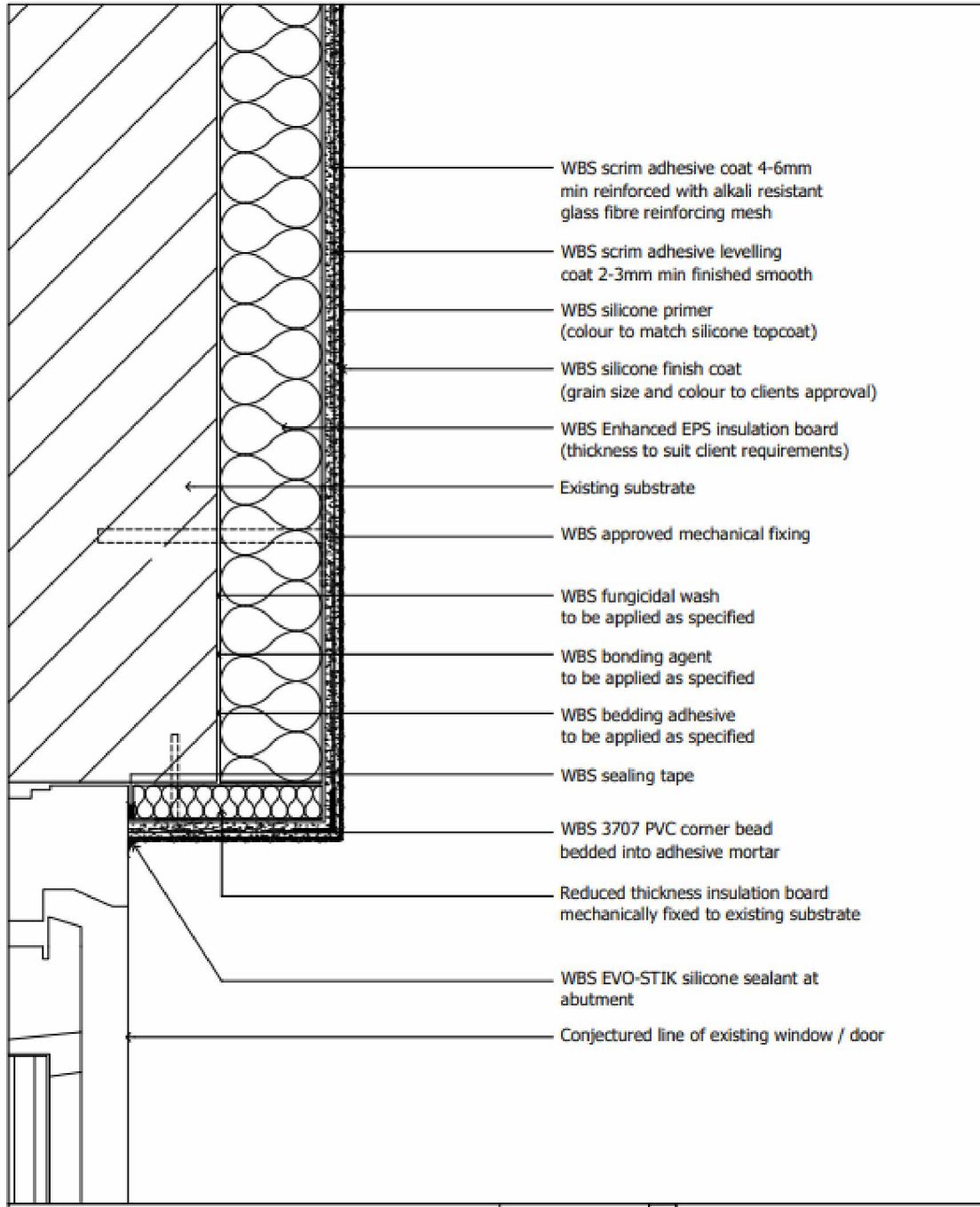


## C2.4 DPC Detail

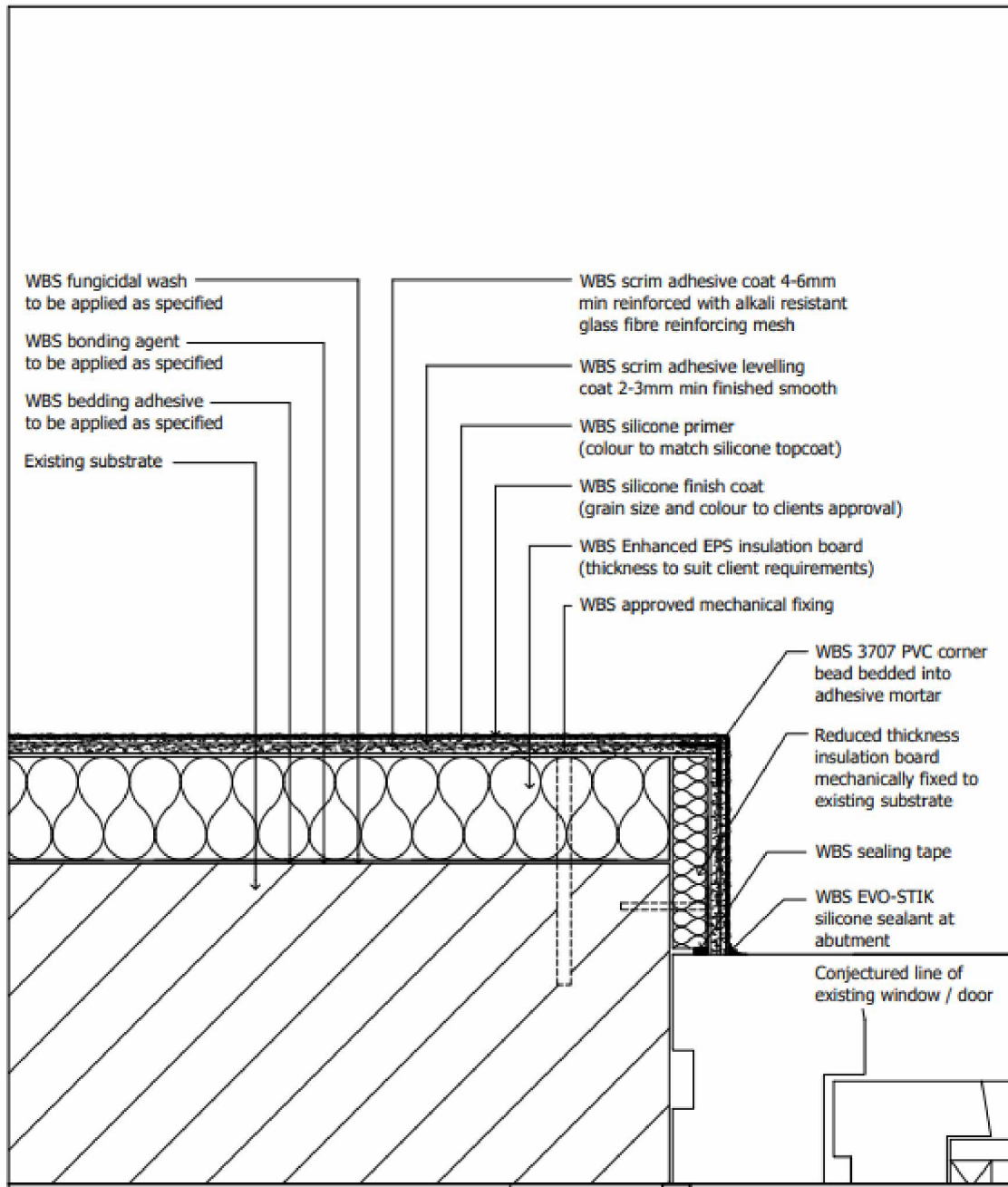




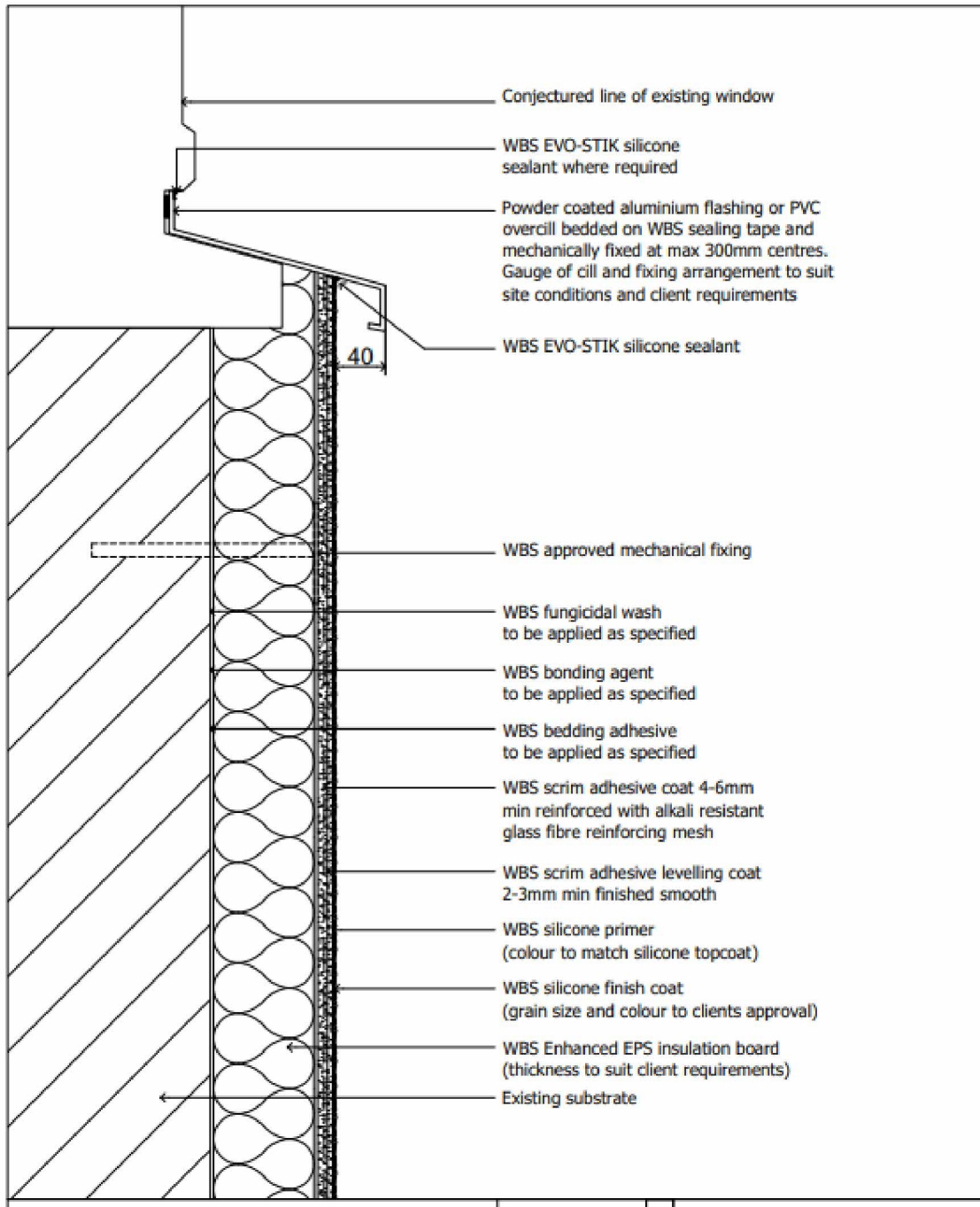
**C2.5 Window / Door Head Detail**



**C2.6 Window / Door Jamb Detail**

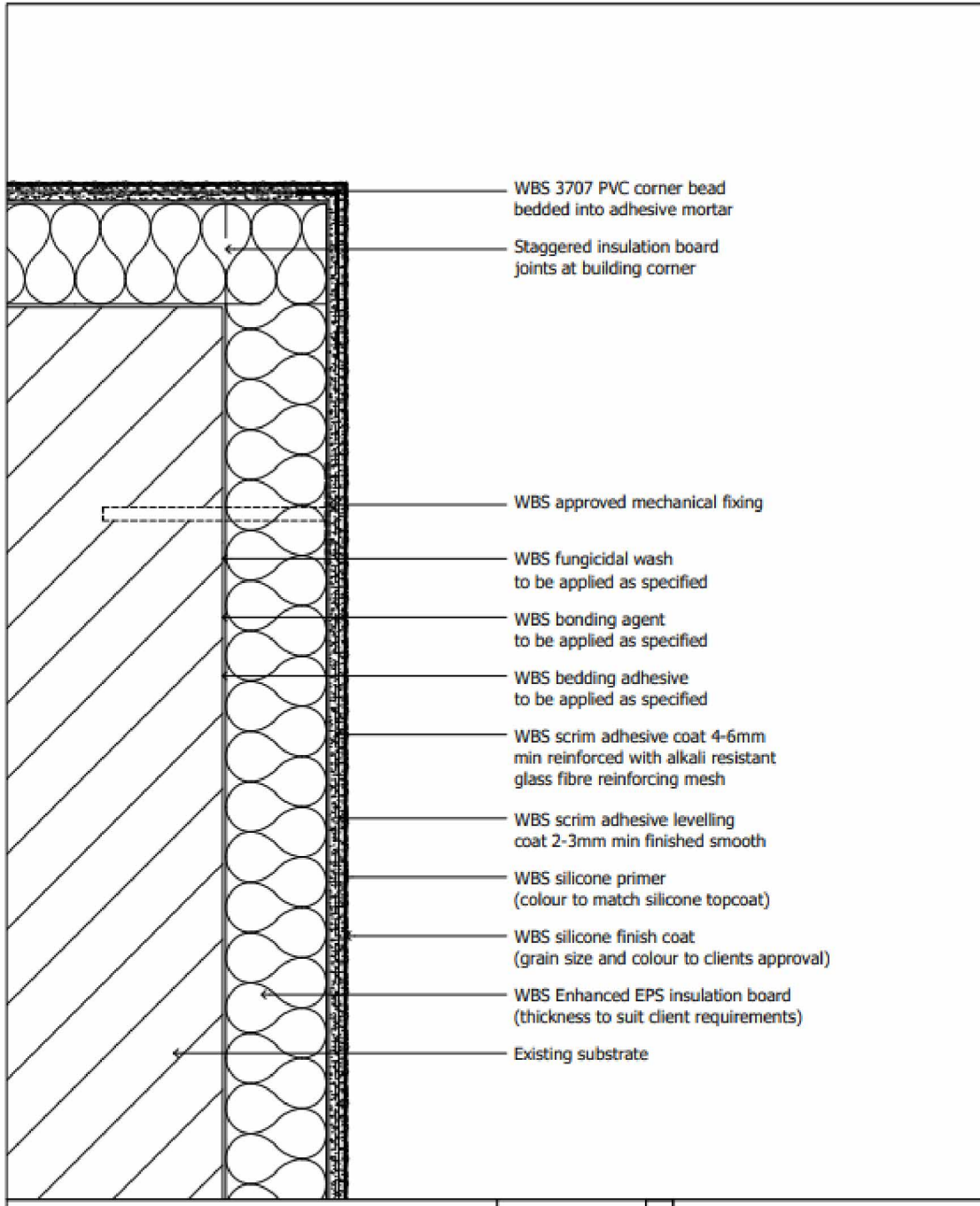


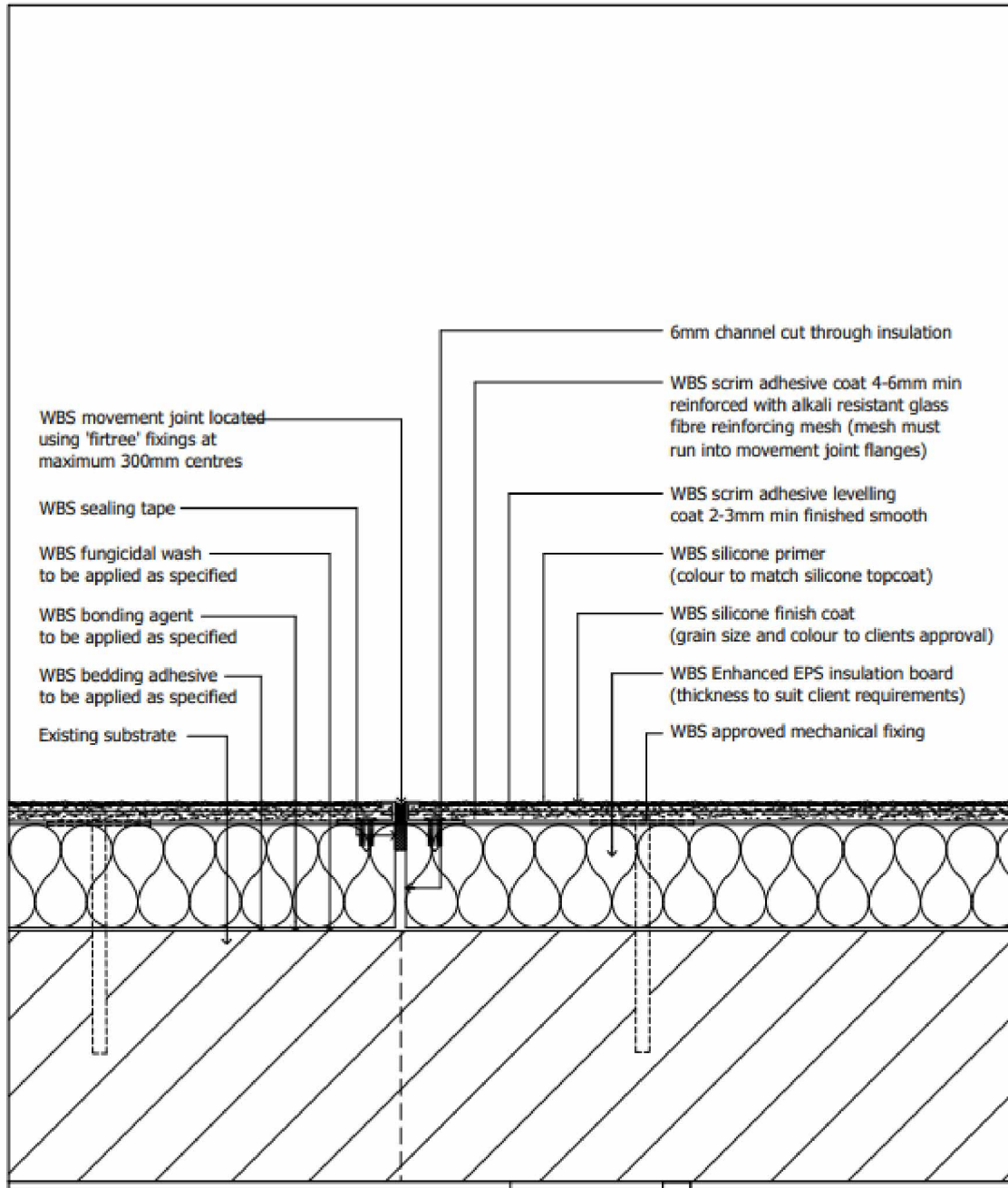
**C2.7 Over cill Detail**



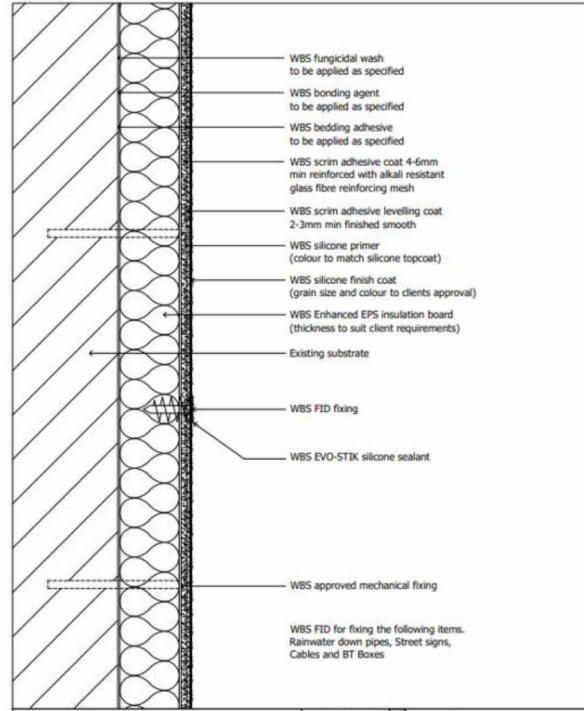
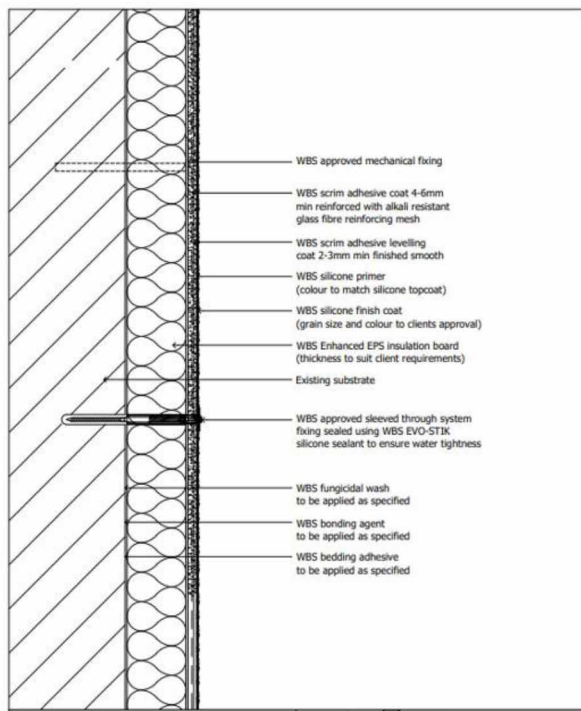
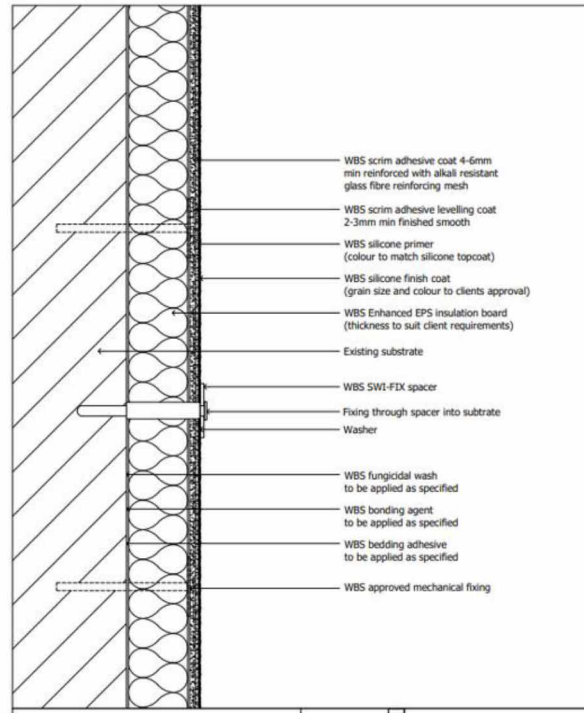
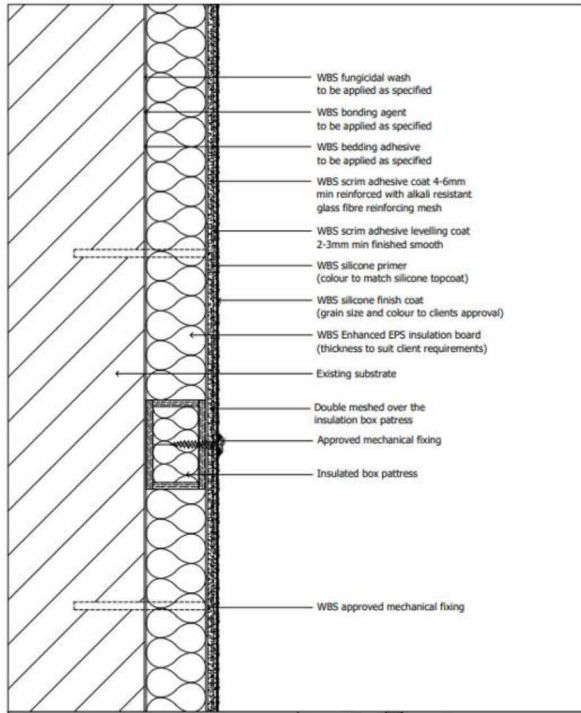


**C2.8 Building Corner Detail**



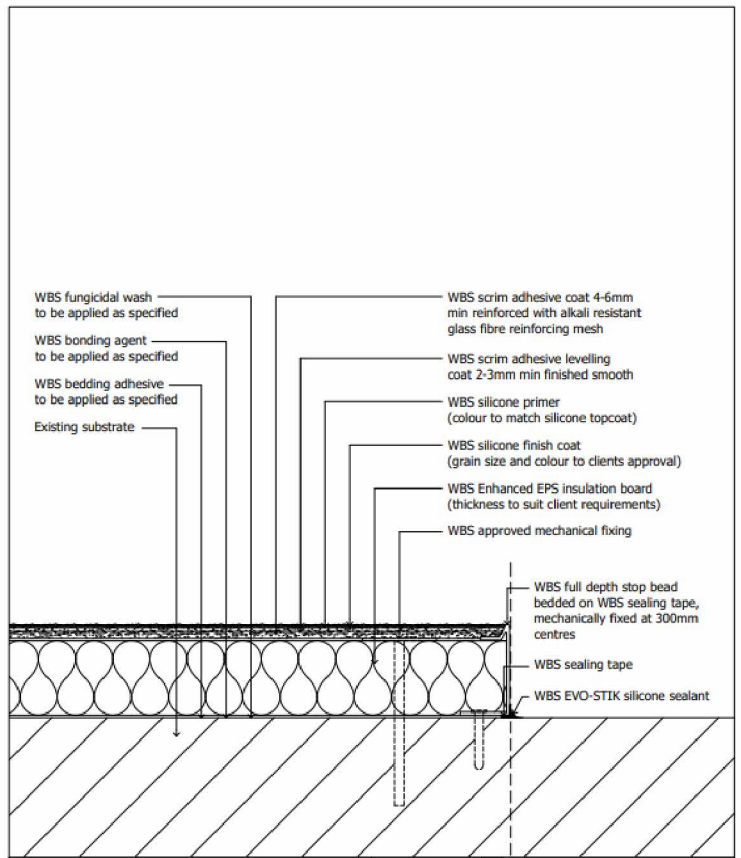
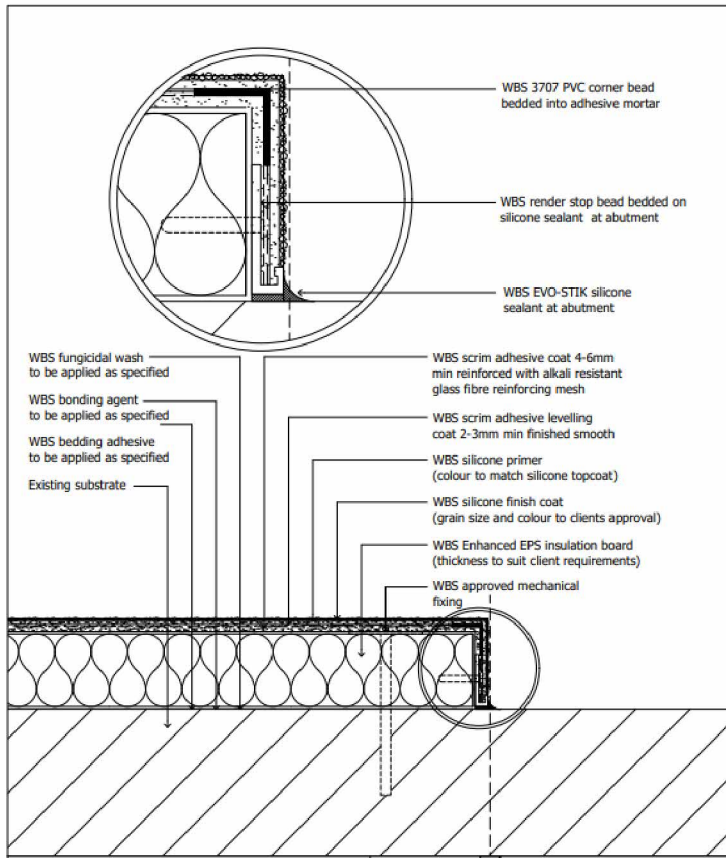
**C2.9 Movement Joint Detail**


## C2.10 External Fixtures Detail

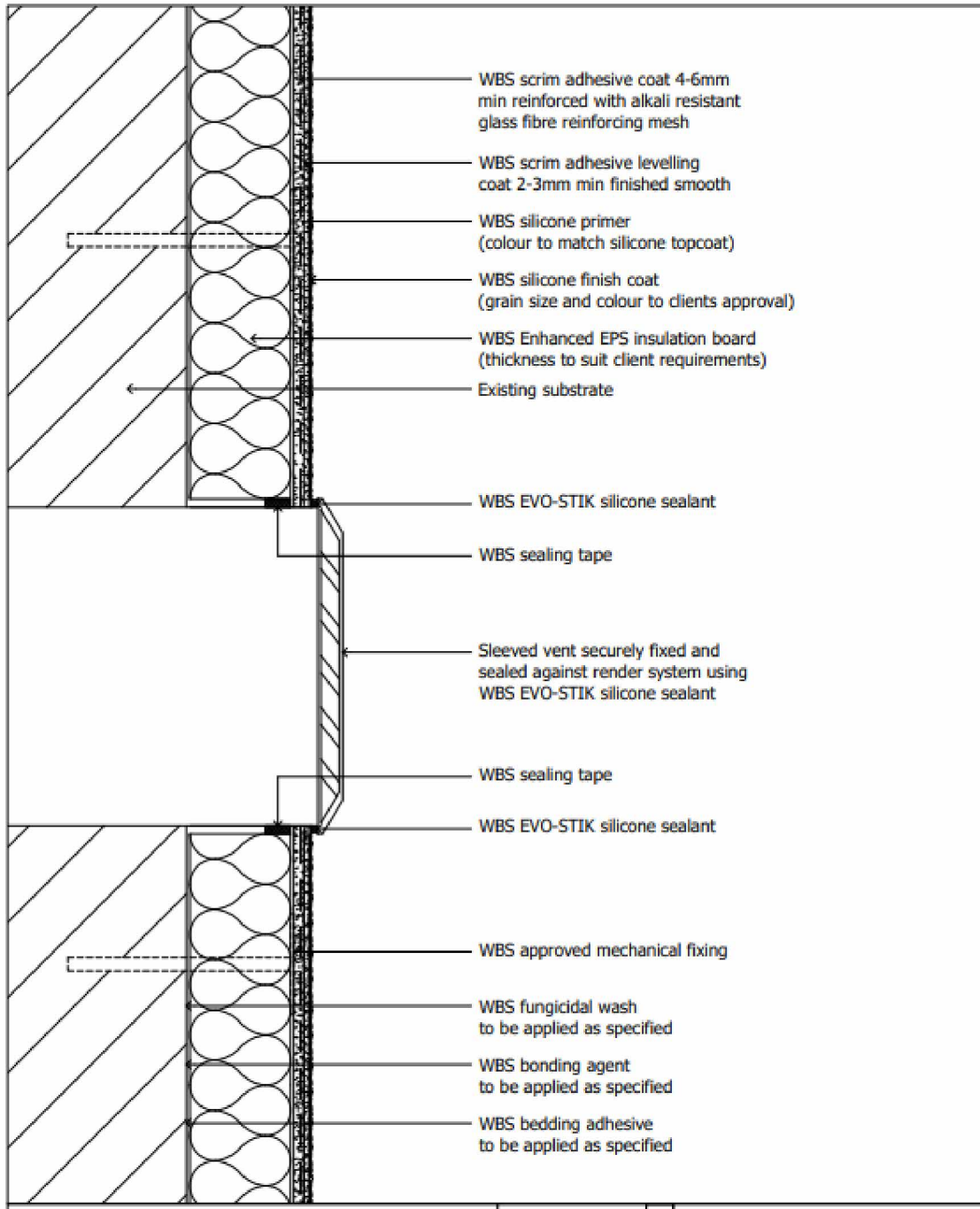


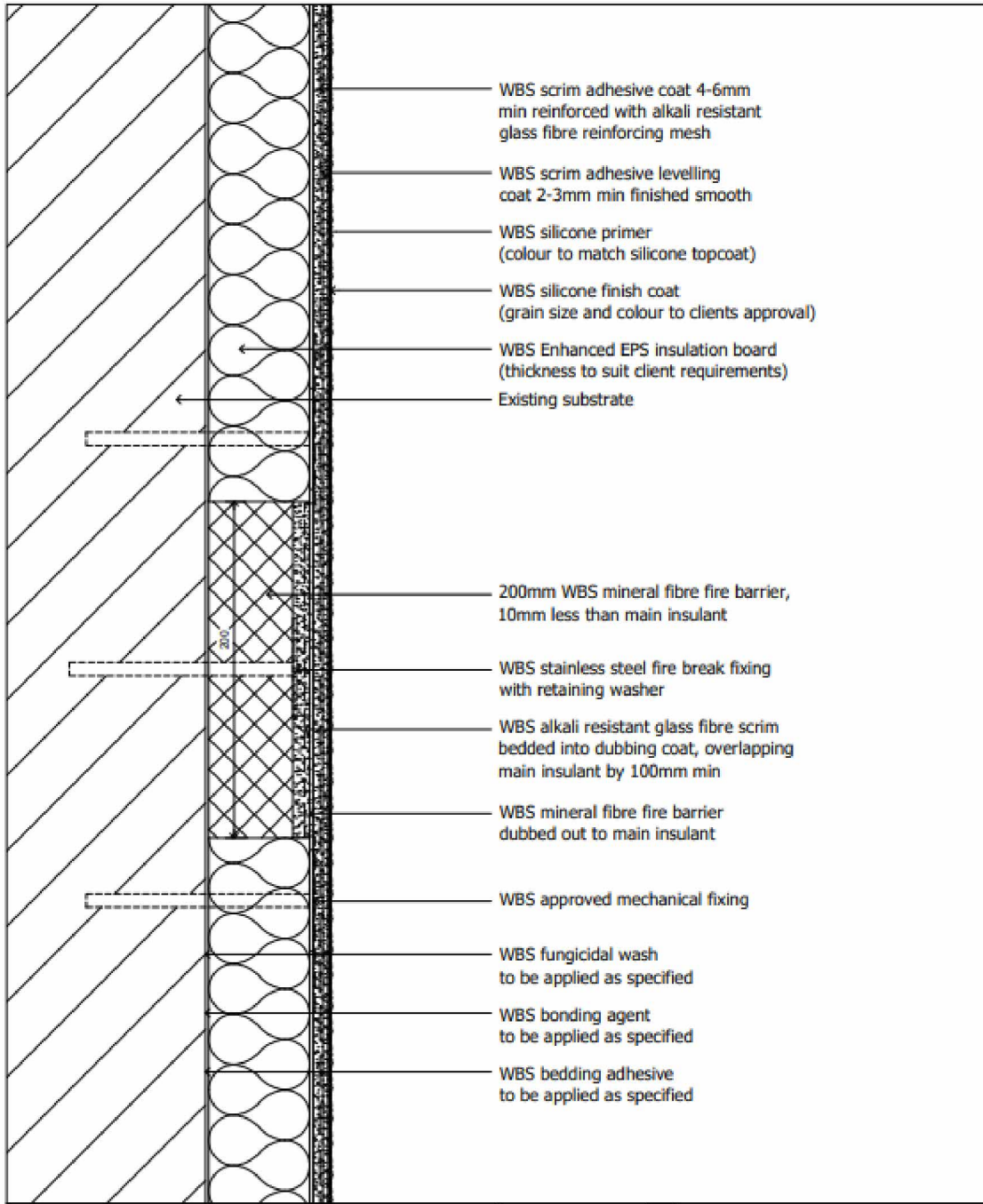


## C2.11 Party Wall Details



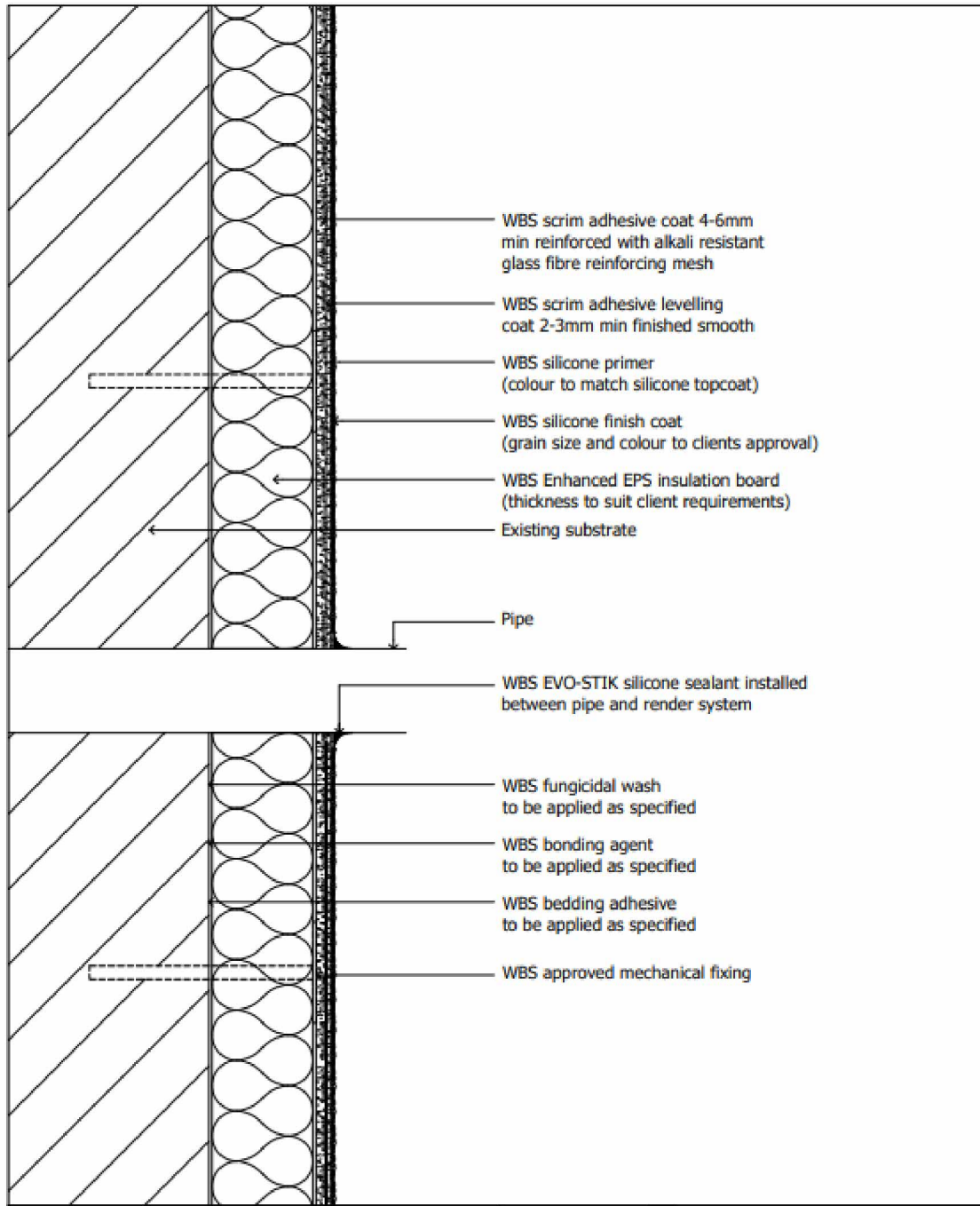
**C2.12 Air Vent Detail**



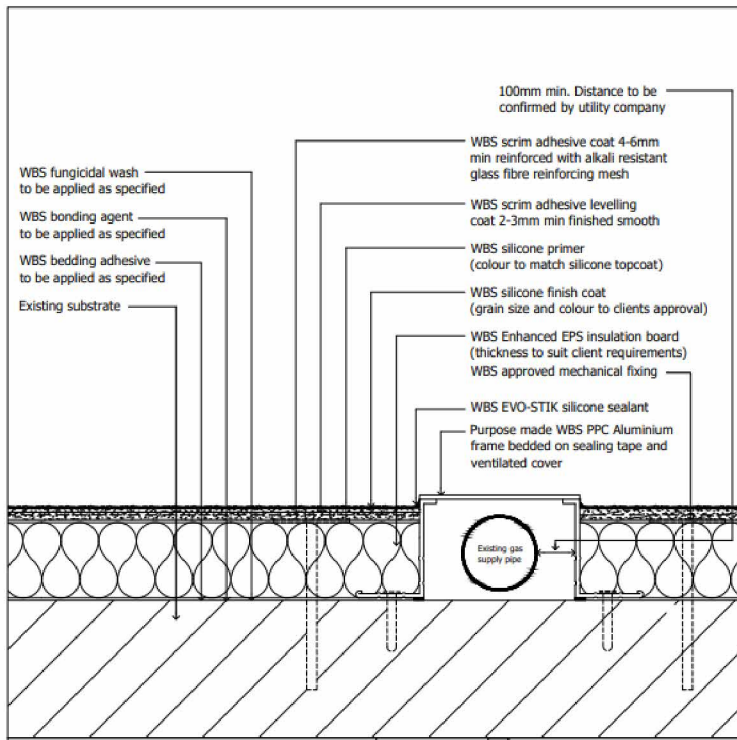
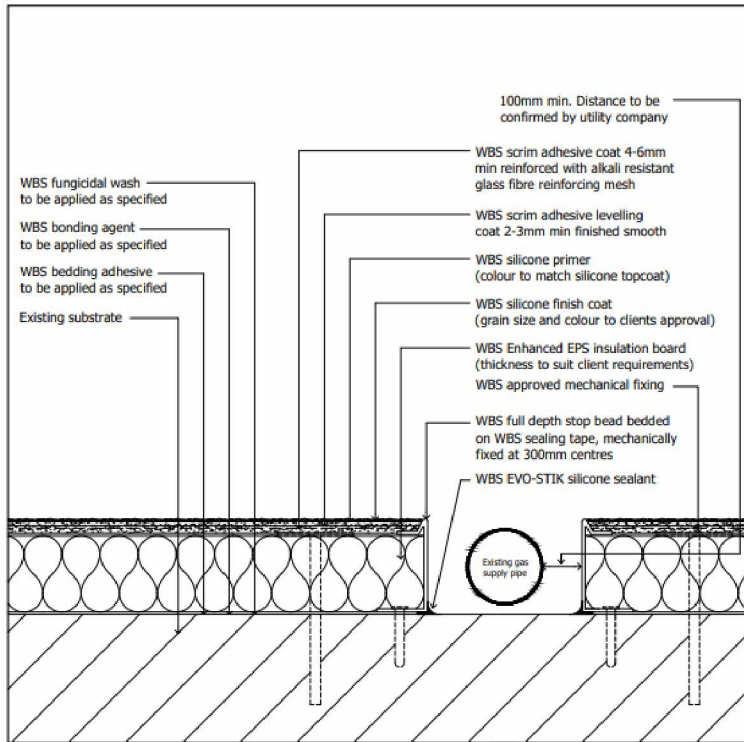
**C2.14 Fire Barrier Detail**




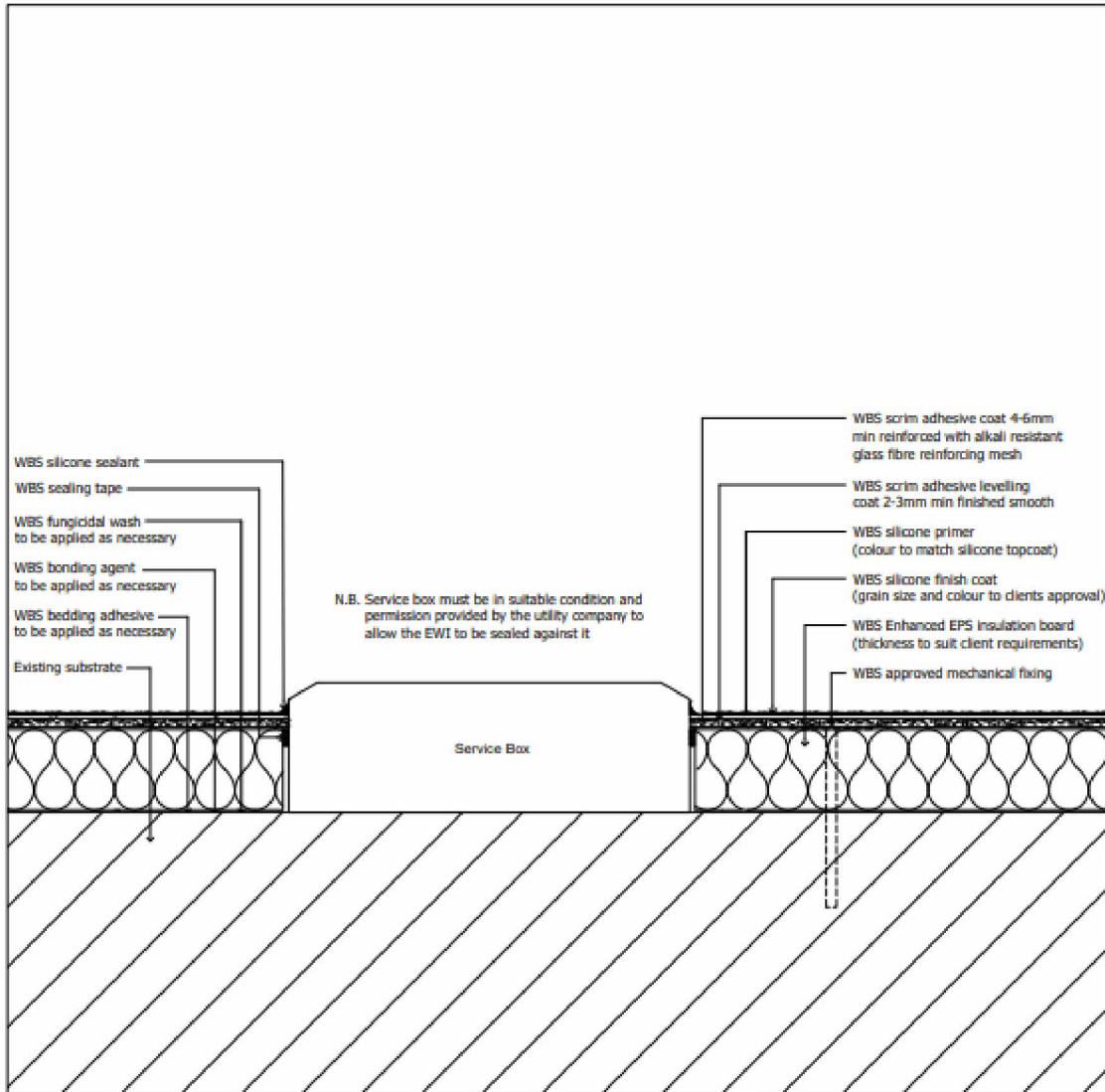
**C2.15 Pipe Detail**



## C2.16 Gas Pipe Details



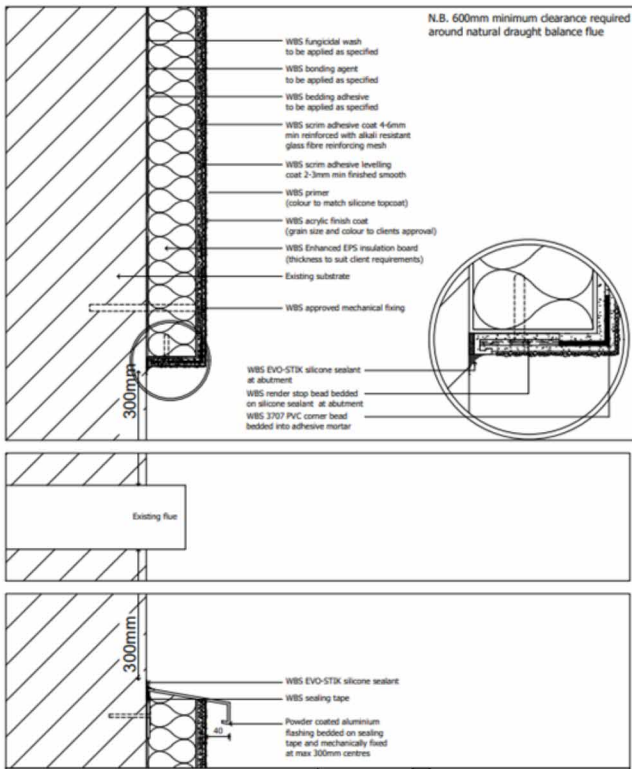
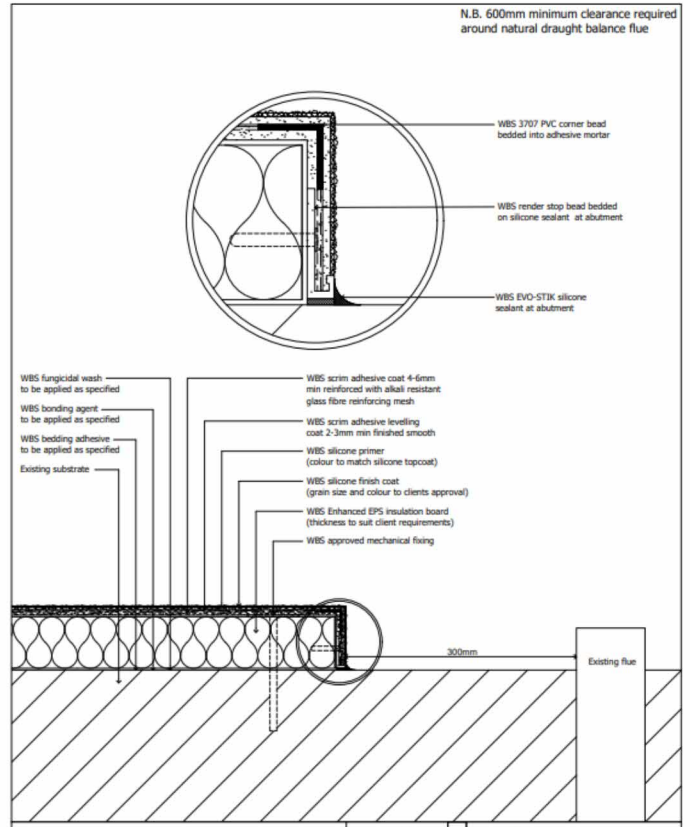
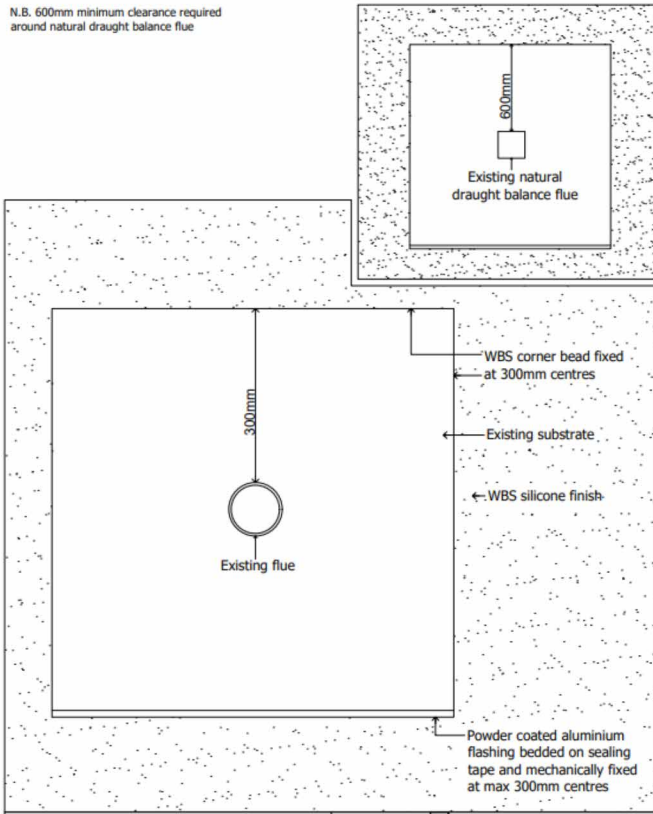
**C2.17 Meter Box Detail**



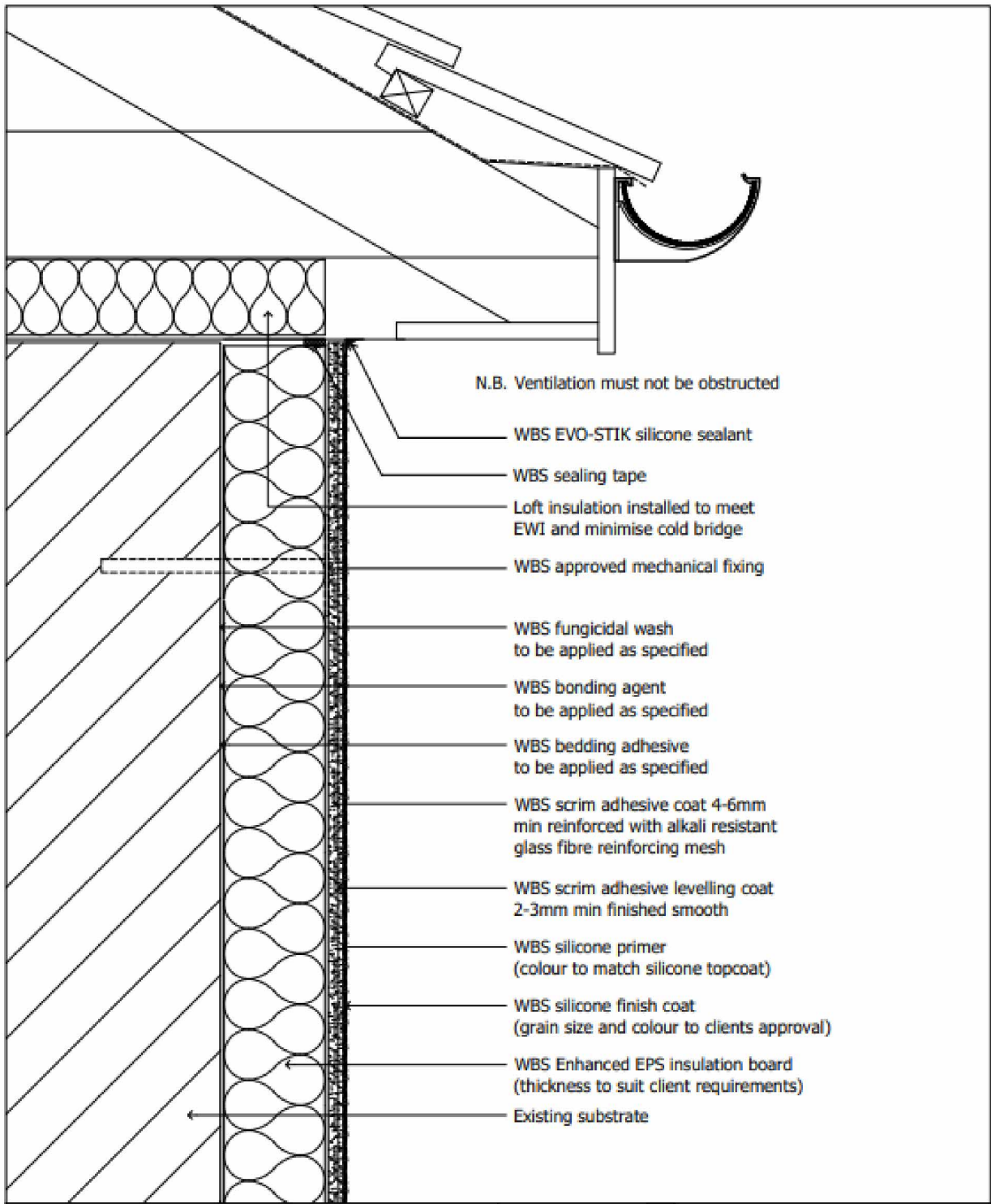


## C2.18 Flue Detail

N.B. 600mm minimum clearance required around natural draught balance flue



**C2.19 Roof Abutment Detail**



## C2.20 Chimney Detail



As per specification on page 11

## 2.3 Thermal Bridge and Weathering Risk

### D2.3.1 Background and Context

The installation of external wall insulation (EWI) to improve the thermal performance and efficiency of residential and non-residential building has become widespread and is well established in the UK, with many installations over 30 years old, and the approach is recognised as being able to bring significant reductions in heat loss to the walls of buildings as well as contributing to a reduction in CO2 emissions.

In order for optimum performance to be achieved, external wall insulation systems (a form of so-called 'solid wall' insulation, SWI) should be designed and installed to have good continuity of the insulation with few thermal bridges, and should be detailed to ensure that water penetration from the external environment is prevented so that the insulation layer remains dry, and so that problems associated with water collection in the building fabric do not occur.

This Specification for Weathering and Thermal Bridge Control comprises of a set of design details which have been prepared for use by practitioners of external wall insulation, including Retrofit Designers, Architects, and installers.

The details provided are not exhaustive, but set out the general principles involved to ensure that installed EWI systems address issues of thermal bridging and weather tightness. The details provide guidance only, and are intended to assist designers and other practitioners to differentiate between details which might result in thermal bridging and/or risk of failure due to weather penetration.

The Thermal Bridging elements of these details have evolved from the details provided in support of PAS2030:2017, and have been extended to include guidance on providing weathering resistance.

Those thermal bridging details that are green coded provide a managed control of thermal bridging, whilst those coded as amber have an increased risk of condensation and mould growth associated with them if internal conditions - in terms of ventilation and temperature - are unfavourable. On some wall constructions these amber-coded details may pose no risk but this would need to be proven by the additional undertaking of thermal bridging modelling or by otherwise ensuring that internal



humidity levels and ventilation conditions are such that the condensation risk is adequately reduced for the lifetime of the measure.

In all cases, practitioners must make every reasonable endeavour to ensure that thermal bridge free detailing is adopted and should demonstrate that, where green-coded details are not employed, every effort is made to incorporate details that come as close to the green-coded detail as is practicably possible, and the amber- coded details are deemed to satisfy this requirement.

The long term weathering resistance of an installed EWI system is dependent not only on the type and quality of the materials of the system, but also on the detailing and quality of installation.

Effective prevention of water penetration (i.e. weathering resistance) can be achieved by considering the EWI system details, identifying possible modes of failure ('Risks') which would result in water penetration, and providing guidance on how the risks can be reduced or eliminated altogether ('Solutions').

The guidance in this document considers a range of typical construction elements which may be found on most retrofit installation projects and identifies the potential risks as far as weathering are concerned. In each instance, one or more approaches are offered which, if followed, will provide a long lasting and durable weather resistant detail.

In some cases, works to other building elements may be required in order to provide an optimised detail - these can be considered to be 'best practice'. In other cases it is understood that best practice may not be achieved for technical reasons or for reasons of practicability. In these cases, the details provided identify the risks associated with employing a less robust detail. Building owners and practitioners should be advised that failure to adopt best practice guidance at an early stage may result in higher costs as a result of problems caused by taking an easier route at an early stage.

Although other details will invariably arise on individual projects and which are not covered within this document, the same underlying principles apply insofar as it is possible to design and install an EWI system that is entirely weather tight and which will provide a satisfactory level of performance for the lifetime of the building onto which it is applied, taking into account necessary inspection and maintenance cycles.

### **Pre-installation Surveys**

Prior to preparing a specification for the installation of EWI on a building it is essential that a detailed survey of the property is carried out by a competent person. Poor assessment of the baseline condition of the building structure can cause problems, or lead to the aggravation of pre-existing conditions and may result in an inappropriate specification for the EWI system being issued.

The survey, which should be completed before the specification is issued should include all of the following:

- The building location
- The relationship of the building being treated with that of adjoining buildings which are to remain untreated.
- Exposure zone for wind driven rain - reference can be made to BRE publication BR 262 'Thermal Insulation: Avoiding Risks'
- Potential sites of thermal bridging - reference can be made to BRE publication FB61 'Reducing thermal bridging at junctions when designing and installing solid wall insulation'

- Proximity to sources of air-borne pollution (e.g. heavy vehicular or rail freight traffic)
- The state of repair of the wall and other related elements (including drainage)
- Sources of moisture (incidences of rising or penetrating damp)
- Ventilation
- Heritage
- Identification of any defects that should be addressed before installation works begin
- Restrictions or obstacles to the installation
- The number, nature, location and identification of all fuel burning appliances (in accordance with the guidance set out in NIA/HHIC publication 'Specification for the installation of external wall insulation ensuring the safety and operation of fuel burning appliances V.1.0 31st March 2017')

The information collected during the survey will inform the EWI system specification and design which should include all interface, edge and abutment details for which a weathering-critical solution is required, and details which address all potential thermal bridging sites.

Appropriate weathering and thermal bridging control details should then be provided to the installation teams to ensure that the system is installed to achieve optimum performance. Appropriate checks and inspections should be carried out during the installation, and after its completion, to ensure that all of the details have been installed correctly and that the system is appropriately sealed, all in accordance with the details and specification.

No installation work should be undertaken until all of the specified information has been obtained and confirmed.

### **Installation Operatives / Technicians**

To attain a level of competence, EWI technicians/installation operatives must have successfully completed a training course covering all matters referred to in this guide. Trained operatives and their supervisors must be able to demonstrate that they are able to read and understand the detail drawings so that the details supplied by the EEM designer, Architect and/or EWI system designer can be correctly constructed on site.

EWI installation operatives should not undertake works associated with combustion fuel appliances. Works such as removal and re-instatement of condensate drains, modification to pressure relief valve (PRV) discharge pipes etc., may be carried out by another competent person such as a plumber, but if any doubt exists then a Gas Safe registered engineer or other competent person should be consulted.

### **Legal Requirements**

The main legal requirements for protection of the public and employees are the general provisions of the Health and Safety at Work Act 1974, and related legislation, including the Management of Health and Safety at Work Regulations 1999.

These require the drawing up of a 'risk assessment' and plan of protective measures, as well as the appointment of competent persons to ensure that safety requirements are met effectively.

### **Responsibilities of EWI/SWI System Installers**



Where inadequate design and/or installation occurs EWI systems are more vulnerable to installation defects such as poor water tightness, which can lead to the insulation becoming waterlogged or even to water entry into the building, or thermal bridging which can result in dampness and mould growth on internal surfaces.

EWI installers have the responsibility for ensuring that upon completion of the EWI/SWI installation the system is adequately sealed, robust, thermal- and weather-tight. Installers must leave flues, chimneys, combustion air ventilators, and any other items relating to the safe operation of gas appliances in the same (or better) condition than before the EWI installation took place.

Furthermore, if during EWI installation work, faults are identified which could harm the occupants or installation operatives, or if any gas pipework is damaged or disturbed, appropriate action must be taken to safeguard people's health and well-being: Seek immediate advice from a Gas Safe registered engineer and/or contact the Gas Emergency Service.

### **Sealants**

In this guidance the use of sealants (mastics, caulking) as the sole means of providing a weather tight seal between an exterior rendered surface and its abutment to another material is not accepted, in line with PAS rules. In all cases, sealants should only be used in conjunction with an appropriate backing material, such as a compressed hydrophobic tape or proprietary backing rod.

Where sealants are employed to provide a barrier to water penetration (e.g. at service penetrations, etc.) the choice of sealant type must take into account the varying movement capabilities of the sealant material, its UV resistance, adhesion properties, and its compatibility with the materials of the surfaces against which it will be applied. The use of the wrong sealant type for a particular application can result in failure regardless of other factors, and failure can contribute to water penetration at the joint. In all cases where sealants are employed as an outer /external seal, a suitable backing rod or tape must be employed in addition to the sealant.

Sealants should be as specified by the EWI system supplier to ensure compatibility with the render system. Where no recommendation is made by the EWI system supplier guidance on the selection of an appropriate sealant can be found in BS 6213. Sealants should generally be low-modulus elastic types since these are more suitable where constant movement is likely. The long term performance of the sealant should be confirmed by the manufacturer.

### **Sealing Tapes**

Sealing tapes are pre-compressed, expanding foam tapes that are used to provide a permanently elastic weather seals at junctions and abutments. They usually have a self-adhesive backing which makes installation quick, easy and clean and they can be used to seal against the contours of irregular or uneven surfaces. Being permanently elastic, sealing tapes allow for continual expansion and contraction and when fitted under compression, sealing tapes are fully weather resistant and can protect against wind-driven rain.

Sealing tapes can be hydrophobic/water repellent, although the hydrophobic quality of the material is less of a consideration than whether it is an open cell or closed cell foam. Only closed cell foam sealing tapes should be used for weather protection applications - the closed cell structure provides better water sealing properties.

Where joining of adjacent lengths of sealing tape is required to provide a continuous seal, the ends of the tapes should be neatly cut and the ends should be overlapped by about 25 mm. Butted joints should not be used.



### **Beads, Trims, Flashings**

The weathering resistance of beads trims and flashings will depend on the type of material and the conditions that the material is exposed to.

### **Exposure to sunlight / UV**

Metals for trims and flashings are usually aluminium alloy or stainless steel, both of which are unaffected by UV exposure. However, the coatings applied to metals (e.g. polyester powder coatings) will suffer a loss of colour and gloss as a result of prolonged UV exposure.

PVC components that are exposed to sunlight will, to a lesser or greater extent (depending on the purity of the PVC and the presence or absence of UV-absorbing additives) exhibit some surface chalking and discoloration for as long as the exposure persists. Prolonged exposure will also cause the material to lose some of its resistance to impact - the material may become weak and brittle.

### **Effect of temperature changes**

All materials expand and contract with changes in temperature, but PVC has a higher coefficient of linear thermal expansion than that of aluminium or stainless steel. Large, unreinforced, PVC components, such as oversills, will expand and contract more than similar components fabricated from aluminium or stainless steel.

It is important that EWI system abutments to metal and PVC components (e.g. window sills, window frames, overcills, etc.) include flexible, elastic, weather seals, such as compressible tapes, to ensure that weather resistance is maintained even as the PVC or metal expands or contracts due to temperature changes.

In the case of PVCu components, which tend to be much thicker than their metal counterparts, temperature differences across the thickness can also result in significant bowing, so the use of PVC-U components in exposed locations should be considered with care, and sealing tapes should be sized to accommodate the greater degree of movement that PCVu components are likely to exhibit.

Note: For clarity and to avoid duplication, details for working around flue penetrations and other fuel burning appliances and associated fixtures and fittings have been omitted. Reference should be made to the following document for guidance in relation to these areas:

Specification for the installation of external wall insulation ensuring the safety and operation of fuel burning appliances.

### **D2.3 Thermal Bridge and Weathering Risk**



Existing photos

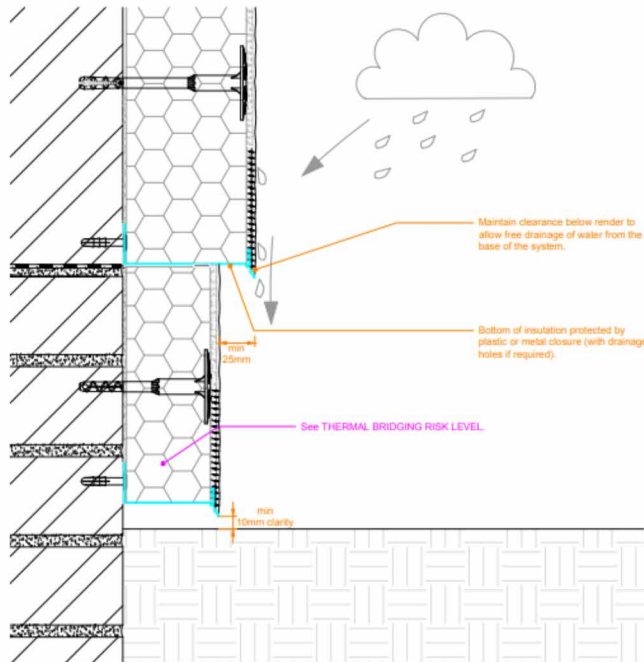
Windows are to be retained at Number 18 and currently have a 20mm reveal

New windows are to be installed in properties 11 - 17

External doors are to be retained and currently have a 40mm reveal

### C3.1 Partially Insulated Plinth

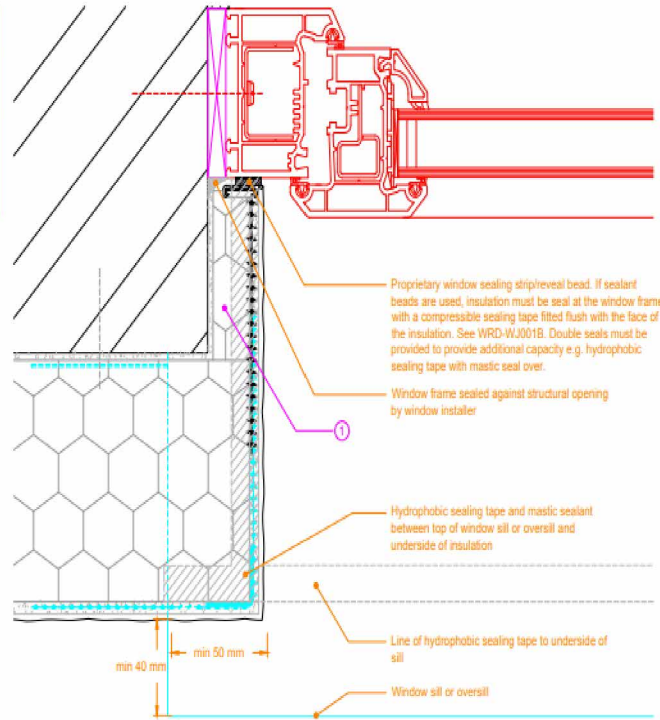
THERMAL BRIDGING RISK LEVEL	
Note:	
• All details indicate fixings that are thermally broken.	
<span style="color: green;">●</span>	Green if insulation has same thickness or same thermal resistance as main wall insulation.
<span style="color: orange;">●</span>	Amber if insulation has a thickness or thermal resistance of at least 75% of main wall insulation. Note that amber will increase the assessed inherent technical risk level in table B2 of PAS 2035 by 1



WEATHERING RISK	
Risk: Inadequate free drainage of water from the bottom of the render prevents render surface from drying.	
Solutions:	
• Maintain a clear gap between the bottom edge of the render and the surface below. Bottom of the system protected by a plastic (low thermal conductivity) or metal starter track/base track.	

### C3.2 Insulation to Recessed Reveals

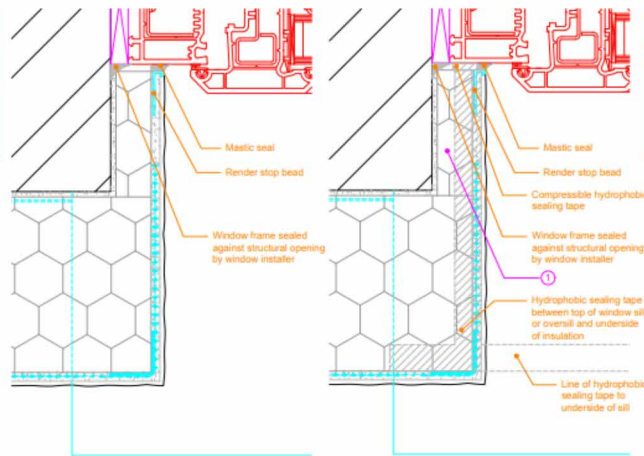
THERMAL BRIDGING RISK LEVEL	
<span style="color: green;">●</span>	Green, no effect on risk level.
Captions :	
① Insulation should have a thermal resistance of not less than 0.6 m <sup>2</sup> K/W. Common practice is to over sail the main insulation board past the reveal by 20 mm and adhesively fix the reveal insulation within the remaining recess.	



WEATHERING RISK	
Risks: Water penetration into EWI system or building at window reveal.	
Solutions:	
<ul style="list-style-type: none"> <li>Windows frame sealed against structural opening and weathertight prior to installation of the EWI system.</li> <li>EWI system sealed against window frame at jamb using proprietary window sealing strip/reveals bead.</li> <li>EWI sealed against window sill/oversill with fully compressed hydrophobic sealing tape and mastic sealant.</li> <li>Designers should consider the use of sills with greater projection where exposure is Zone 4/very severe (BR262).</li> </ul>	

### D3.3 Insulation to Recessed Reveals (2)

THERMAL BRIDGING RISK LEVEL	
<span style="color: green;">●</span>	Green, no effect on risk level.
Captions :	
① Insulation should have a thermal resistance of not less than 0.6 m <sup>2</sup> K/W. Common practice is to over sail the main insulation board past the reveal by 20 mm and adhesively fix the reveal insulation within the remaining recess.	

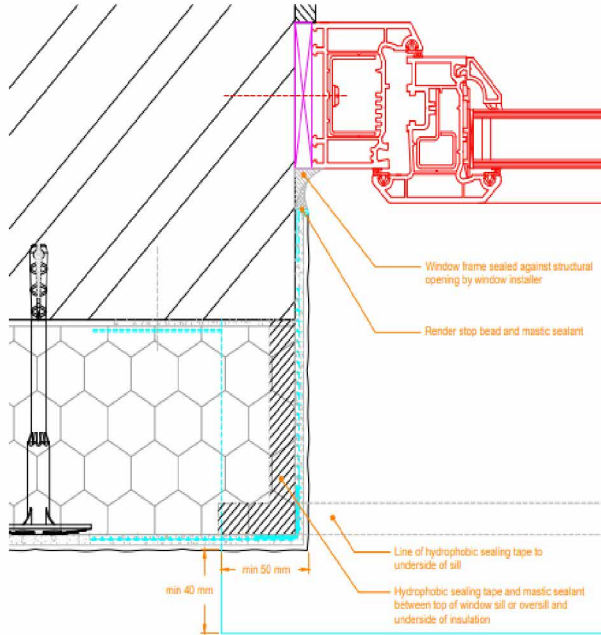


WEATHERING RISK	
Risks: Water penetration into EWI system or building at window reveal.	
Solutions:	
<ul style="list-style-type: none"> <li>Windows frame sealed against structural opening and weathertight prior to installation of the EWI system.</li> <li>EWI system sealed against window frame at jamb using proprietary window sealing strip/reveals bead.</li> <li>EWI sealed against window sill/oversill with fully compressed hydrophobic sealing tape and mastic sealant.</li> </ul>	



### C3.4 Uninsulated Reveal at Jamb

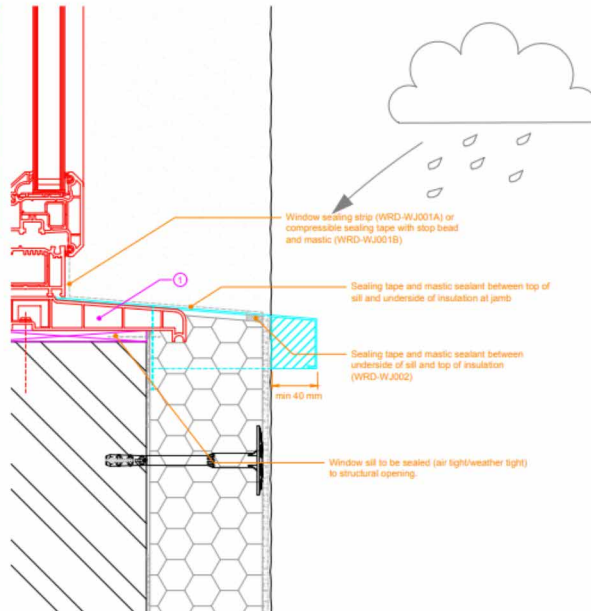
THERMAL BRIDGING RISK LEVEL	
Note:	<ul style="list-style-type: none"> <li>All details indicate fixings that are thermally broken.</li> <li>Detail not allowed where frame thickness allows for reveal insulation.</li> </ul>
	Amber if wall constructed in 2 225 mm solid brick. Not suitable for random stone constructions. Note that amber will increase the assessed inherent technical risk level in table B2 of PAS 2035 by 1.



WEATHERING RISK	
Risks:	Water penetration into EWI system or building at window reveal.
Solutions:	<ul style="list-style-type: none"> <li>Windows frame sealed against structural opening and weatherright prior to installation of the EWI system.</li> <li>EWI system sealed against window frame at jamb using proprietary window sealing strip/reveals bead.</li> <li>EWI sealed against window sill/oversill with fully compressed hydrophobic sealing tape and mastic sealant.</li> <li>Designers should consider the use of sills with greater projection where exposure is Zone 4/very severe (BR262).</li> </ul>

### C3.5 Existing Window with an Over-cill

THERMAL BRIDGING RISK LEVEL	
Note:	<ul style="list-style-type: none"> <li>All details indicate fixings that are thermally broken.</li> </ul>
	Green, no effect on risk level.
	Amber if non-thermally broken sill. Note that amber will increase the assessed inherent technical risk level in table B2 of PAS 2035 by 1.
Captions:	<ul style="list-style-type: none"> <li>Window frame and sill to be thermally broken. All sills should have end caps and be fixed using either mechanical fixings with plastic caps or high strength adhesives.</li> </ul>



WEATHERING RISK	
Risks:	<ul style="list-style-type: none"> <li>Window sill projection insufficient to provide effective water shedding.</li> <li>Differential thermal movement at render abutment to sill may allow water ingress.</li> </ul>
Solutions:	<ul style="list-style-type: none"> <li>Windows sill and frame sealed against structural opening and weatherright prior to installation of the EWI system.</li> <li>EWI system sealed against window sill/oversill with fully compressed hydrophobic sealing tape and mastic sealant.</li> <li>Window sill to provide min 40 mm projection from face of render.</li> <li>If window sill projection is insufficient, provide suitable over- or under-sill (see WRD-WJ003) with min 40 mm projection.</li> <li>Designers should consider the use of sills with greater projection (50 mm) where exposure is Zone 4/very severe (BR262).</li> <li>System should be sealed against the frame by means of a hydrophobic tape and mastic or proprietary stop bead with integral hydrophobic tape.</li> <li>Ensure that any existing drainage holes are not blocked, or install new drainage holes.</li> </ul>
	<ul style="list-style-type: none"> <li>See BS EN 13014-1:2018 Design, preparation and application of external rendering and internal plastering. External rendering.</li> </ul>

### C3.6 Insulation to Recessed Head

**THERMAL BRIDGING RISK LEVEL**

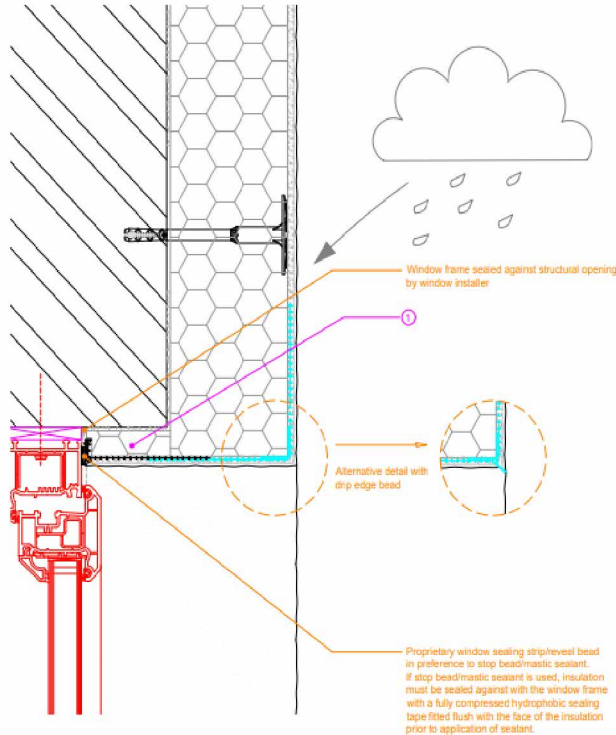
Note:

- All details indicate fixings that are thermally broken.

Green, no effect on risk level.

Captions:

① Insulation should have a thermal resistance of not less than 0.6 m<sup>2</sup>K/W. Common practice is to over-sail the main insulation board past the reveal by 20 mm and adhesively fix the reveal insulation within the remaining recess.



**WEATHERING RISK**

Risks: Water back-tracking to window frame.

Solutions:

- Windows frame sealed against structural opening and weathertight prior to installation of the EWI system.
- EWI system sealed against window frame at head using proprietary window sealing strip/reveal bead or sealing tape, stop bead and low modulus sealant (see WRD-AU001B).
- Drip edge corner bead at aris in lieu of standard corner bead to provide improved water shedding at render return into reveal at head.

### C3.7 Service Box Outside EWI System

**THERMAL BRIDGING RISK LEVEL**

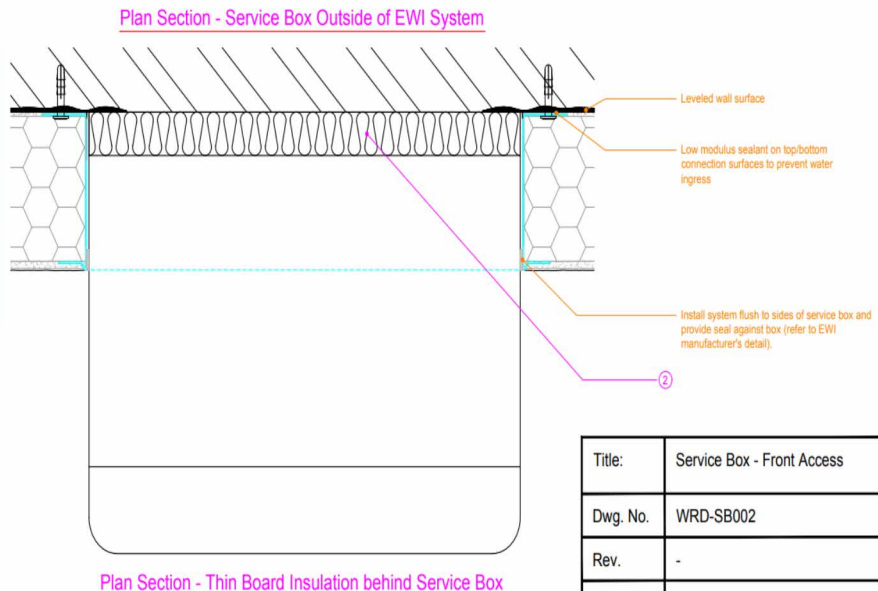
Note:

- All details indicate fixings that are thermally broken.
- Movement of service boxes should be undertaken by the owner of the box, i.e. The utility company, or movement without consent would be an act of trespass.

Amber. Note that amber will increase the assessed inherent technical risk level in table B2 of PAS 2035 by 1.

Captions:

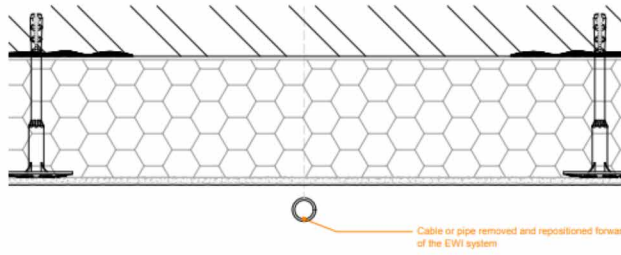
② Permissible. Insulation ensuring 18 March 2017.



Title:	Service Box - Front Access
Dwg. No.	WRD-SB002
Rev.	-
Date:	18/12/2018

### C3.8 Pipework and Electrical Cables

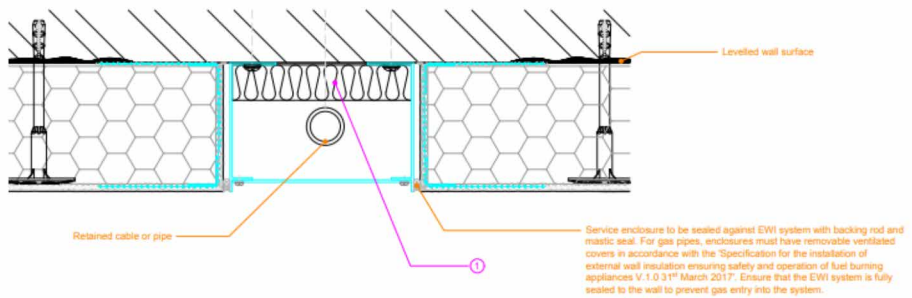
THERMAL BRIDGING RISK LEVEL
Note:
<ul style="list-style-type: none"> <li>All details indicate fixings that are thermally broken.</li> </ul>
<p><span style="color: green;">●</span> Green, no effect on risk level.</p>



WEATHERING RISK
Risks: N/A
Solutions: N/A

Plan Section - External Pipe/Cable

THERMAL BRIDGING RISK LEVEL
Note:
<ul style="list-style-type: none"> <li>All details indicate fixings that are thermally broken.</li> </ul>
<p><span style="color: orange;">●</span> Amber. Note that amber will increase the assessed inherent technical risk level in table B2 of PAS 2035 by 1.</p>
<p>ⓘ Provide insulation within gas pipe/electrical services enclosure where practicable/permisible.</p>



Plan Section - Thin Board Insulation behind Gas/Electrical Service Enclosure



### C3.9 Heavy Weight External Fixings

**THERMAL BRIDGING RISK LEVEL**

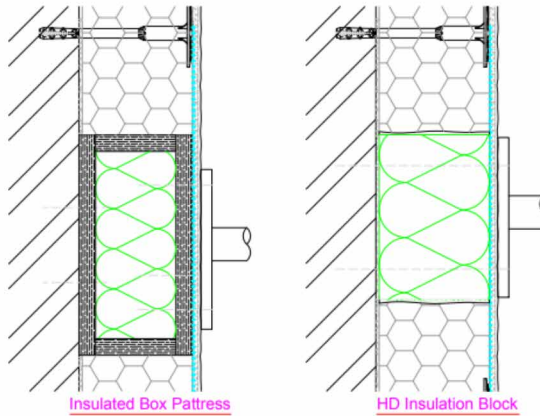
Note:

- All details indicate fixings that are thermally broken.

Green, no effect on risk level.

Captions:

- Thermally broken, cantilevered through fixing. Refer to manufacturer for allowable loadings.

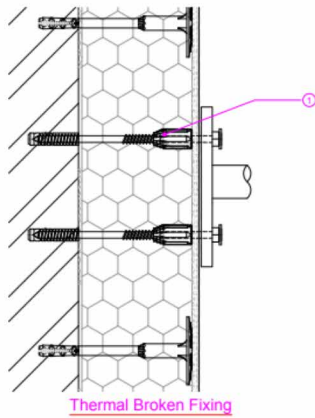


**WEATHERING RISK**

Risks: Water ingress into insulation at fixings.

Solutions:

- Ensure fixings are sealed against render with EPDM gaskets or proprietary waterproof sealant.



Title:	Heavy Weight External Fixture
Dwg. No.	WRD-EFF001
Rev.	-
Date:	18/12/2018

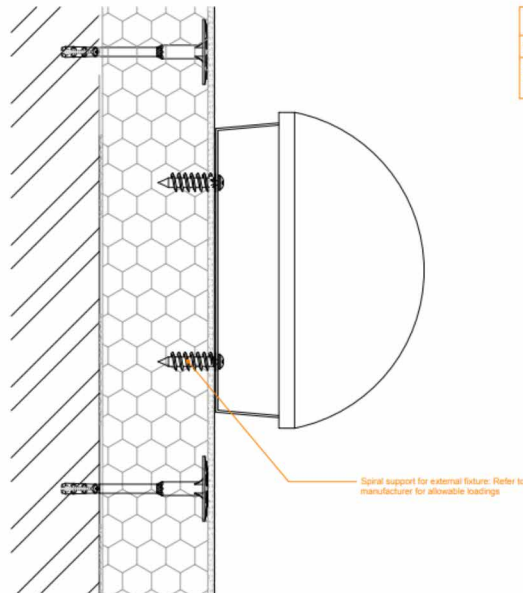
### C3.10 Lightweight External Fixings

**THERMAL BRIDGING RISK LEVEL**

Note:

- All details indicate fixings that are thermally broken.

Green, no effect on risk level.



**WEATHERING RISK**

Risks: Water ingress into insulation at fixings.

Solutions:

- Ensure fixings are sealed against render with EPDM gaskets or proprietary waterproof sealant.

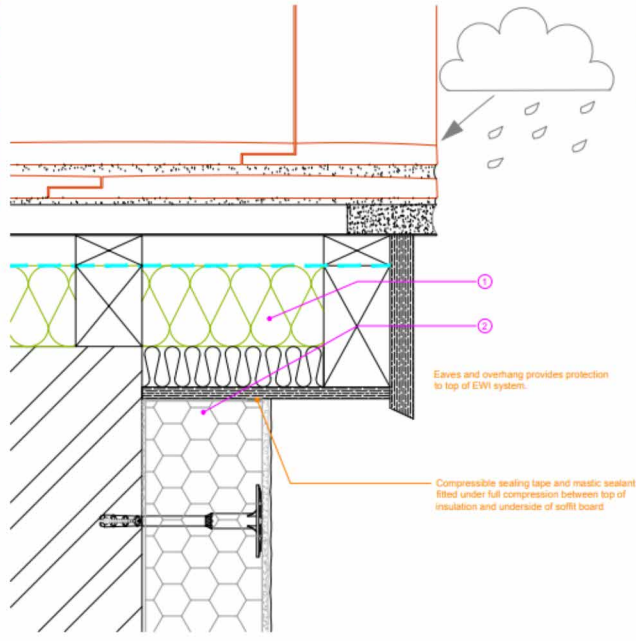
### C3.11 Overhanging Eaves

**THERMAL BRIDGING RISK LEVEL**

Note:  
 • All details indicate fixings that are thermally broken.

Green, no effect on risk level.

Captions:  
 ① Ensure loft insulation extends across top of external wall insulation.  
 ② System installed to underside of existing soffit and fascia or, if practicable, remove existing fascia and install system as far up the existing wall as possible.



**WEATHERING RISK**

Risks: Low. Overhanging verge provides weathering protection to EWI system. Larger overhang offers greater protection.

Solutions: Roof extended as necessary to provide overhang to EWI system.

## D4 Windows Specification

### D4.1 Materials

Item	Proposed Performance Specification	Additional Requirements
<b>Manufacturer (Extrusion)</b>	Manufacturers to be accredited to BS7413, BS7950 and BS EN 12698	10 Year Guarantee  Beading to be made available for 10 years from installation or all beading to be replaced at manufacturers cost.  Locking systems to be available for 10 years from installation.  Stainless steel friction stays to be available for 10 years from installation.
<b>Material Type</b>	PVC-U To BS 7412 Option of White and Rose Wood finish	
<b>Manufacturer (Fabricator)</b>	Frames to be manufactured to BS 7950 - with full accreditation Ensure welds polished	
<b>Profile</b>	To BS EN 12608 70mm (+/- 0.5mm), to relevant British Standard, plus option for 60mm profile Minimum wall thickness 3mm, incorporating drainable chambers on both side of a centre sealed reinforcement chamber Steel/Aluminium/recycled PVC-U reinforced to system company recommendation/composite reinforced/recycled	
<b>Beading</b>	70mm Profile - internal decorative bead/splayed bead (unless external beading is required to BS 7950, with relevant security tape)	
<b>Glazing</b>	Double glazing to comply with current Part L and N building regulations Energy efficient glazing Default standard 28mm (4-20-4) construction Option for 24mm (4-16-4) construction Option for toughened/laminated glass to BS 6262: Part 4: 1994 Option for self cleaning glass	

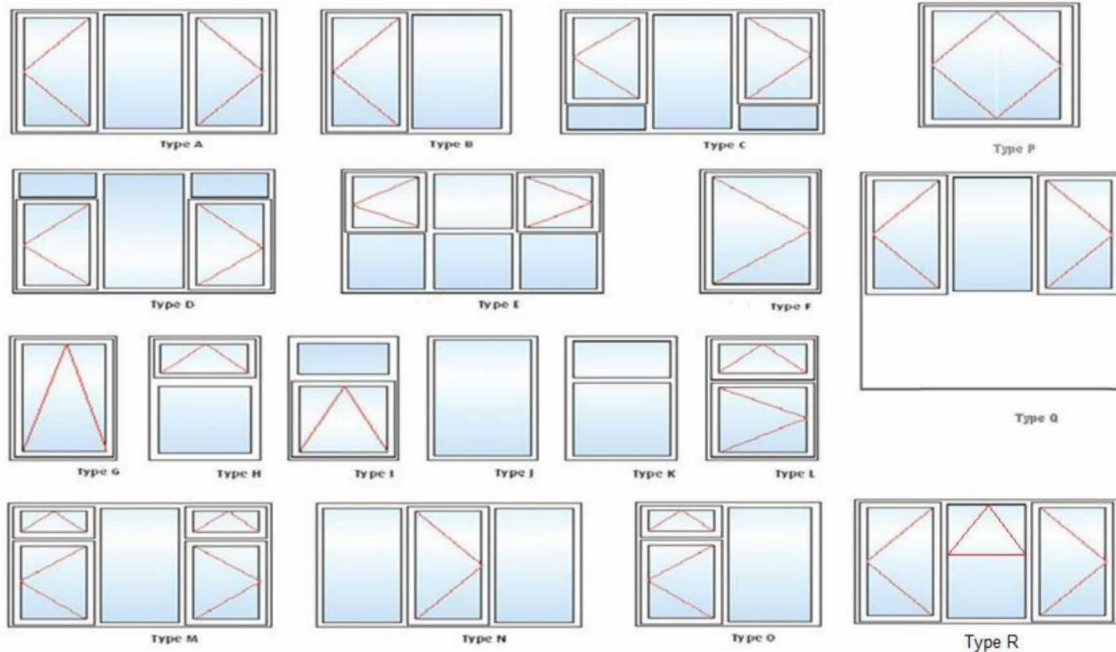
<b>Window Type</b>	As per library below	
<b>Seals</b>	To BS 4255-1:1986 Standard black seal Option for white	
<b>Locking Mechanism</b>	Espagnolette bi-directional gearbox type system with austenitic bar and cam to casements and sashes to comply to BS 7950, BS EN 1670 Class 4 and 'Secure by Design' performance	
<b>Top Hung Sash</b>	Stainless steel friction stays (>450mm restricted, <450mm unrestricted) Require anti-jemmy device Option for austenitic stainless steel friction stays	
<b>Side Hung Sash</b>	Stainless steel friction stays (restricted if required to meet building regulations) Require anti-jemmy device (all opening windows to be fitted with two pairs of non-contact ancillary security device. Positioned adjacent to and, not more than 50mm away from the top of each hinge). Option for austenitic stainless steel friction stays	
<b>Fire Egress</b>	Egress stainless steel friction stays All windows must comply with BS 5588 Part 1 and Building Regulations Approved Document Part B1 – One opening in every habitable room on first floor, except kitchens, should provide an unobstructed area of at least 0.33m <sup>2</sup> with minimum size of 450mm in any one direction. Effectively this should provide a clear opening of 450mm x 734mm. Egress Windows should be identified with a Green button to the handle All egress sashes to have integral child restrictor stay – Windows to be fitted with a clearly visible and intuitive to release <b>Cavity Fit Restrictor</b> , tested to comply with BS 6375 Part 2: 2009 to withstand a force of 350N for one minute when opened at the position and fitted to provide a maximum opening of 100mm in the restricted position. Restrictor to be manufacturer from Austenitic 304 Stainless Steel tested to meet the requirements of BS 7412: 2007 and BS EN 1670: 2007 Class 4 corrosion resistance. Require anti-jemmy device (All opening windows to be fitted with two pairs of non-contact ancillary	

	security device. Positioned adjacent to and, not more than 50mm away from the top of each hinge.) Option for egress austenitic stainless steel friction stays Manufacturer should identify the fire egress on the survey	
<b>Handles</b>	To BS6462-1985 strength Test C3 Offset Handle Button locking standard on all windows, option for DDA complaint handles Additional cost for Key Locking Handles, to be agreed with client, minimum 2 keys per window Requirement for all ground floor and bungalow windows to have key locking handles	
<b>Hardware &amp; Fixings</b>	To BS EN 9001:2000 covered by the manufacturers Partnership Pledge 12 Year Audited Warranty Scheme To be accredited to 'Secure by Design' performance Hinges to be fully reversible Fixing screws are to be stainless steel to all hardware and fittings Option for austenitic stainless steel hardware to BS 7479	
<b>Night-vent</b>	Night-vent facility to be 'deactivated' on ground floor windows Foam insert to be placed within vent	
<b>Ventilation</b>	Ventilators to include foam insert to meet Document F of Building Regulations Style to be agreed with client – adjustable trickle ventilation to be fitted to all windows in accordance with BS6375 Part 1: 2004 all in compliance with the Building Regulations Approved Document Part F. Option of pull cord to open/close vent	
<b>Infill panel</b>	28mm insulating infill panel to be self finished as required	
<b>Energy Rating</b>	Minimum C rated, in accordance with the British Fenestration Rating Council (BFRC) Option B and A rated	

<b>Electronic Opener</b>	Option for electronic opener on window, to be agreed with client	
<b>Measure</b>	The measure to be compliant with the Code of Practice for Surveying: 'British Federation - 'Code of Practice for the Survey and Installation of Replacement Windows and Doorsets'	
<b>Identification</b>	All doors to be individually marked with property address, location and manufactured date and manufacturers details	
<b>Maintenance &amp; Cleaning</b>	To conform with BS8213 Part 1 Code - cleanable from inside the property - where practicable	
<b>Instructions</b>	A3 or A4 guide should be provided with windows to demonstrate how to operate locking mechanism operates and cleaning/maintenance instructions	



## Window Library



### C4.2 Window Installation

#### C4.2.1 General

All preparation, installation and finishing works shall be completed in accordance with BS8213-4:2016 Windows and Doors.

Code of Practice for the survey and installation of windows and external door sets and comply with the latest Building Regulations.

Before commencing any works, Contractors shall be required to note the location of all overhead power supplies. Where there is a requirement for the movement of overhead cables, the Contractor must notify the Stroud District Council and await further instruction.

Upon carrying out the pre-inspection of each property, the Contractor should highlight evidence of missing over leaf lintels, or movement above window heads and refer these to the Stroud District Council for a decision prior to the commencement of any installation works.

The Contractor will install and seal the new windows on the same day that the existing windows are removed, to maintain security and the weather tightness of the structure.

#### C4.2.2 Removal

Prior to works commencing the Contractor should ensure that all relevant documentation e.g. drawings, Tenant choice information, survey sheets, special instructions etc. are available and understood. Prior to the commencement of work the sizes, type and condition of all windows should be checked both against the survey sizes and types and against the actual aperture sizes. It will be the manufacturers responsibility to ensure that the window/door are correctly handed.

The Contractor is responsible for both internal and external protection of the property during the installation work. Care should be taken to protect Tenants fixtures, fittings, furniture, decoration and

other personal belongings during the course of the works. Any damage caused by the Contractor shall be rectified at their own expense and to the approval of SDC

The existing windows should be removed with care to avoid unnecessary damage to the building structure and its finishing's and without permitting any movement of the superstructure during or after the installation procedure

Any electrical or specialist items, such as television aerials or telephone wires, shall be re-routed around and not through the frame of the window. Where this is not feasible, then alternatives shall be agreed with the Contracting Authority. The presence of curtain tracks in the aperture shall be noted.

The Contractor shall provide all necessary temporary internal and external support prior to removal of any window or frame enclosures.

Where possible the Contractor should check cavity trays and lintels to ensure they are in reasonable condition. Where they are damaged or defective, the Contractors shall notify Stroud District Council before commencing any installation works.

Cavity wall insulation shall be maintained. Where the cavity wall insulation is damaged or removed during the removal works, the Contractor shall replace the insulation accordingly, where there is no cavity wall insulation, the Contractor shall notify Stroud District Council prior to installation.

### **C4.2.3 Installation**

**All windows and glazing products must be installed by PAS 2030 certified installers**

#### **What is PAS 2030?**

PAS 2030:2019 relates to companies who are installing energy efficiency measures (EEM) in existing domestic buildings or 'dwellings', sometimes referred to as retrofit or refurbishments.

PAS 2030 is the industry standard that all installers who are installing energy efficiency measures under Government initiatives must meet. The standard sets requirements for different elements of the business, including installer competence, technical knowledge and ability, management systems, skills training and health & safety policies

The materials to be used shall be as specified by Stroud District Council of the Materials Supplier. Installation shall be as per the manufacturer's instructions and comply in all aspects to BS8000-0:2014 Workmanship on Construction Sites. Introduction and General Principles. Through frame fixings are to be used, following the Manufacturer's instructions. These should be designed and installed to take all likely imposed loads which will cause the frame to deflect. Screws shall be austenitic stainless steel, sized to penetrate at least 38mm in to timber, plugged holes in brick, block or masonry unless equivalent demonstrable provision can be made by other means. Connections to steelwork up to 2mm thick such as folded sheet lintels should be made with appropriate thread cutting screws, to steelwork over 2mm thick into pre-tapped holes with machine screws of a minimum 5mm diameter, alternatively with power-driven hardened self-drilling screws.

The heads of all fixings screws shall be covered with the appropriate colour matched plastic over caps.



Where this activity schedule does not provide for sufficient clarity, the final location, nature and quantity and quality of frame fixings shall be completely in accordance with the frame manufacturer's recommendations and agreed with Stroud District Council prior to fixing.

Polyurethane foam fixing shall not be used as the sole method of fixing the frame in place.

Prior to the use of any foam fixing the Contractor shall seek approval from Stroud District Council for the material and its planned application prior to installation. Care shall be taken to ensure that the foam fills all voids and avoids excess pressure to the frame, which may lead to distortion. Finishing's, such as trims, shall be used to neaten the interface between window and substrate. They should not be used to provide or enhance the weather tightness of the window or door or the perimeter joints. Finishing's, where required, shall be good exterior quality materials used in accordance with the manufacturer's instructions and colour matched where specified.

Consumable items such as sealants shall be colour matched, and should last for the lifetime of the installed window / door. Sealants should be selected accordingly to ensure that they are not prone to discolouration over time. Care should be taken to ensure that the mastic is finished with a neat struck joint and is always applied in accordance with manufacturers' recommendations.

Cellular extruded PVCu trims shall conform to BS 7619:2010 Extruded cellular unplasticized white PVC (PVC-UE) profiles and be fitted in accordance with manufacturer's instructions. Trims shall be obtained from the same materials supplier, from the same frame profile to ensure colour match.

Internal trims to be applied to all reveals.

Frames shall be installed centrally in openings, fixed square and plumb within the aperture, without twist, racking or distortion of any member, level on cills and head.

Frames will be fixed with cills and head drips, except frames directly under eaves or frame with arched infill panels, both of which will have cills only or as otherwise agreed with Stroud District Council

Coupled window assemblies are to be delivered to site as separate window units to ease handling and minimise damage.

When building up components into the required assembly, care should be taken to keep coupling joints equal and frames both aligned and plumb. Ensure that perimeter fixings are made close to coupling bar ends. Coupling joints must have seals, such as bedding mastic, expanding bituminised tapes, or flexible polymer gaskets, placed within the profile cavity during the assembly operation. It is not sufficient to rely solely on external pointing sealant.

Coupled windows/assemblies shall be fastened together in accordance with the manufacturer's instructions. The Contractor shall be responsible for obtaining Stroud District Council approval for the proposed coupling assembly.

For frames with arched heads, the existing timber arch infill shall be replaced in conjunction with the window using a minimum of 10mm closed cell PVCu board, scribed and sealed to the arch and overlapping the frame head a minimum of 12mm, fixed to new timber grounds using stainless steel nails or screws. The Contractor shall install insulation behind arched heads in accordance with Contracting Authority's requirements.

Replacement windows are generally positioned to minimise the amount of making good. Important points to allow for include:

- The new frame must bridge the DPC / DPM. Any damaged DPC / DPM shall be repaired.
- The position of the frame within the reveal shall be agreed with the Contracting Authority prior to commencement of works.



- The correct movement gap must be consistently maintained and centralised around the full perimeter of the frame.

Open cavities noted between inner and outer skins of brick or blockwork are to be bridged or closed using an insulating material, care being taken to maintain integrity of damp proof membrane, and adequate purchase for fixing screws ensured, using extended fixing lugs as required.

Appropriately sized installation packers shall be used adjacent to fixing positions to prevent outer frame distortion during installation. Installation packers shall be resistant to compression, rot and corrosion and shall span the full depth of the outer frame. The fixings shall be tightened so that the frame is held securely against the packers without distorting the frame.

When lugs are used, they shall be packed off the substrate to prevent distortion. Where enhanced security is required, additional packers shall be used adjacent to hinge and locking points.

End caps to cills should be suitably in accordance with the property type and should remain in place with the product.

Debris or contaminants shall be removed and any drainage channels to frames shall be cleared.

Internal reveals shall be made good as agreed, ready for the Tenant to redecorate if necessary.

The Contractor may use internal PVCu beading of up to 15mm where necessary. Any materials such as trims or sealant, should not be applied on top of existing wall coverings or protective tapes as any subsequent removal of that wall covering or tape could also remove the trim or sealant.

All protective tapes should be removed as soon as practicable upon completion of the works. Sand and cement shall not be used to fill the gap between the outer frame and the substrate at the frame head and jambs.

Where the replacement product has a smaller front to back dimension than the original, then there may be a mastic and / or paint line visible on the substrate which should be removed as much as practicable.

Internal reveals shall be made good, ready for Tenant to re-decorate if necessary. External rendering shall be made good and painted to match existing finishes.

The Contractor shall ensure that the window is operable by the Tenant before leaving the property, with all opening sashes adjusted and in working order. Locks and operating keys should be made available for the Tenant and Stroud District Council where requested.

The Contractor shall allow for re-installation of Tenant's blinds and curtains to the windows.

The Contractors should ensure that re-installation of these items does not void the warranty of the windows/doors and operation is to the satisfaction of the Tenant or Contracting Authority.

#### **C4.2.4 Glazing**

All glazing shall comply with the requirements of BS 6262-4:2005 Glazing for buildings and BS 8000-0:2014. In addition, any glass or insulating glazing unit manufacturer's instructions shall be followed.

All insulating glass units shall be examined for damage prior to installation. Defective units shall not be used. Insulating glass units with low emissivity coatings shall be oriented in accordance with manufacturer's instructions. Failure to do so will render the coating less effective.

Windows and doors may be delivered ready glazed. Alternatively, they may be supplied with glass units and pre-formed glazing gaskets to be applied on site in accordance with manufacturer's instructions. No extra over shall be allowed for where toughened or laminated glass is to be installed.

Where butyl based, polyethylene, PVCu or acrylic glazing tapes are used, they shall be capped with silicone sealant.

Perimeter joints must be sealed from the outside with a sealant appropriate to:

- The frame surface;
- The substrate material;
- Joint size and configuration;
- Anticipated joint movement; and
- Anticipated exposure to weather.

The void between the frame perimeter and substrate to be filled with a polyethylene foam rod of suitable diameter, prior to the application of sealant. Deep filling is to be avoided.

The sealant shall not adhere to the backing but shall permit relative movement.

All external finishes are to be made good to existing. Where the Contractor cannot complete this on the day of installation, they should return to the property within five working days following installation works to complete the making good.

Where required, re-pointing under windows is to be included.

#### **C4.2.5 On Completion**

After installation a final inspection shall be carried out to ensure that the installation is fully in accordance with requirements.

On completion of installation, all frames and glazing shall be thoroughly cleaned inside and out, and all labels removed prior to final handover. The frames and glass shall be thoroughly cleaned inside and out, with manufacturer approved products, to ensure no discolouration or damage to the windows / doors.

Final installation will include, but shall not be limited to, carrying out the following checks and completing any resulting remedial or corrective action prior to hand over:

- All glazing beads and gaskets are properly fitted;
- All opening lights and casements function correctly and are fitted square within the frame;
- All locking points engage, and all hardware, furniture, keys and ventilators operate correctly;
- No gaps exist between frame and weather strips;
- All debris has been removed from drainage channels and all internal making good has been completed;
- There are no cracks, breaks or scratches in any frame member;
- The frame perimeter is properly sealed, and the sealant has adequately bonded to the substrate.

The Contractor shall check all windows to ensure no twisting of the frame has occurred during installation.

The Contractors shall demonstrate to the Tenant the correct operation of the frame ventilators, restrictors, fire egress provision, handle fasteners and key locking and unlocking.

This shall be accompanied with written operating and maintenance instructions, such as those published by trade federations.

In occupied properties, a key for each window shall be clearly tagged and handed to the Tenant.

For unoccupied / void properties, all keys will be handed to the Contracting Authority.

The Contractor shall provide a FENSA (or equivalent) certification to the Contracting Authority within 30 days of the installation works. This is a maximum timeframe and individual Contracting Authority's may request for certificates to be received sooner than 30 days, where applicable this will be agreed during the call off process.

## **C5 Kitchen Extract Fan : Vent Axia Response 7 (494143)**

### **C5.1 Description**

The Response fan is a continuously running extract fan for kitchens, utility rooms, bathrooms and toilets.

The product incorporates an airflow detection system that detects the installation duct resistance and maintains the correct fan speed to achieve the preset extract flow rate (model dependent).

The incorporated LED display allows the installer to configure the fan to suit its installation. The display is also used to show the day logger and power run meter.

The fan can be wall, window or panel/ceiling mounted

### **C5.2 SAFETY AND GUIDANCE NOTES**

- A.** All wiring to be in accordance with the current I.E.E. Regulations, or the appropriate standards of your country and **MUST** be installed by a suitably qualified person.
- B.** The Fan is suitable for installation within Zones 1 & 2.
- C.** The Fan should be provided with a local isolator switch capable of disconnecting all poles, having a contact separation of at least 3mm.
- D.** Ensure that the mains supply (Voltage, Frequency, and Phase) complies with the rating label.
- E.** The Fan should only be used in conjunction with the appropriate Vent-Axia products.
- F.** The fan should only be used in conjunction with fixed wiring.
- G.** When the Fan is used to remove air from a room containing a fuel-burning appliance, ensure that the air replacement is adequate for both the fan and the fuel-burning appliance.
- H.** The Fan should not be used where it is liable to be subject to direct water spray for prolonged periods of time.
- I.** Where ducted Fans are used to handle moisture-laden air, a condensation trap should be fitted. Horizontal ducts should be arranged to slope slightly downwards away from the Fan.
- J.** This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- K.** Young children should be supervised to ensure that they do not play with the appliance.



# Lo-Carbon Response

CONTINUOUS EXTRACT FAN

Installation and Wiring Instructions



## Stock Ref. N°

494143 - Response 7

494144 - Response 7 Pro

494150 - Response 7 SELV

494149 - Response 7 Pro SELV

### C5.3 Speed selection

Set trickle and boost speeds in l/s by using the buttons.

To convert m<sup>3</sup>/h to l/s, divide the m<sup>3</sup>/h by 3.6 (e.g. 54m<sup>3</sup>/h / 3.6 = 15 l/s).

The Trickle Speed cannot be higher than the Boost selection. Therefore it might be necessary to modify the Boost selection before increasing the Trickle setting.

If “0” is selected for the trickle speed, the fan will be off until a boost signal is activated (for example via LS/ pullcord/humidity).

### C5.4 Boost time

The boost setting allows the boost timer to be adjusted from 1-30 minutes, the default is 15 minutes. This option may also be disabled, thus removing the option from the menu and setting the overrun to 0.

**Inbuilt Ambient Response Humidistat with Rapid Rise Detection** The humidity threshold setting defines at what relative humidity the fan will trigger, adjustable from 40% to 90% rH. The fan increases in speed slowly between the trickle and boost speeds between the trigger %rH and +10%. The trigger point will automatically adjust if the temperature drops below 18C to prevent nuisance triggering.

The fan also incorporates a rapid rise function to detect rapid rises in humidity when the ambient %rH is under the threshold setting. If a rapid rise is detected the fan will increase in speed proportionally between the trickle and boost settings until the humidity lowers again.

### C5.5 Comfort mode

- With comfort mode disabled, the fan will go into boost as soon as an LS (Light Switch) input is detected and over-run for the set period after LS is disconnected.
  - With comfort mode enabled, the fan will remain off / in trickle up to a maximum of 20 minutes. Once LS is deactivated, fan will run at boost mode for the length of time LS was present up to a maximum of 20 minutes plus the set over-run time.
- If the LS was activated for < 3 minutes, no boost will occur to prevent nuisance activations.

### C5.6 Fan Control Mode

There are 3 modes for fan speed control. Wall, ducted and constant airflow/ volume (CV) mode (CV - Pro models only). In wall or ducted mode, the fan speeds are pre-determined at the factory and does not use the airflow sensor.

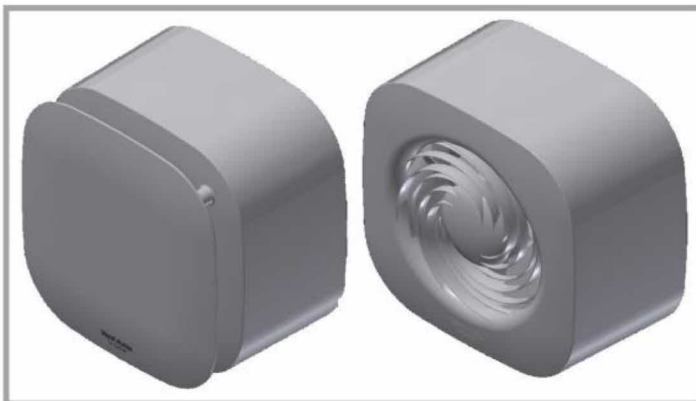
In CV mode (Constant Airflow/Volume), the fan will automatically adjust the fan speed to maintain the desired airflow. After the first 15 minutes of

### D6 Bathroom Extract Fan: Vent Axia Revive 7 (473848)

# Lo-Carbon Revive

CONTINUOUS & INTERMITTENT EXTRACT FILTERLESS FAN

Installation and Wiring Instructions



#### Stock Ref. N°

Revive 7	473848
Revive 7 SELV	473849
Revive 5	473850
Revive 5 SELV	473851
Revive	473852
Revive SELV	473853
Revive Intermittent	478367
Revive SELV Intermittent	478368

### C6.1 Description

The Revive fan is a continuously running or intermittent extract fan for kitchens, utility rooms, bathrooms and toilets.

The incorporated LED display allows the installer to configure the fan to suit its installation. The display is also used to display the day logger and power run meter. (Not available on Revive & Revive SELV models) The fan can be wall, window or panel/ceiling mounted.

### C6.2 SAFETY AND GUIDANCE NOTES

- A. All wiring to be in accordance with the current I.E.E. Regulations, or the appropriate standards of your country and MUST be installed by a suitably qualified person.
- B. The Fan should be provided with a local isolator switch capable of disconnecting all poles, having a contact separation of at least 3mm.
- C. Ensure that the mains supply (Voltage, Frequency, and Phase) complies with the rating label.
- D. The Fan should only be used in conjunction with the appropriate Vent-Axia products.
- E. The fan should only be used in conjunction with fixed wiring.
- F. When the Fan is used to remove air from a room containing a fuel-burning appliance, ensure that the air replacement is adequate for both the fan and the fuel- burning appliance.
- G. The Fan should not be used where it is liable to be subject to direct water spray for prolonged periods of time.
- H. Where ducted Fans are used to handle moisture-laden air, a condensation trap should be fitted. Horizontal ducts should be arranged to slope slightly downwards away from the Fan.
- I. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- J. Young children should be supervised to ensure that they do not play with the appliance.

### D6.3 Settings

Mode	Trickle	Boost 1	Boost 2	Boost time
Kitchen	6-13 l/s	30 l/s	60 l/s	1-30 minutes
Bathroom	6-13 l/s	15 l/s	30 l/s	1-30 minutes

#### Installation selection

There are four different installation type settings, kitchen or bathroom and ducted or window/wall. The difference between bathroom and kitchen mode is shown above, the boost speeds are higher for kitchen applications. If the fan is installed in a ducted setup changing the fan to ducted mode will compensate for the reduced airflow due to the higher pressure of the system. During commissioning select the relevant setting for your installation.

#### Boost time

The boost setting allows the boost timer to be adjusted from 1-30 minutes, the default is 15 minutes

#### Humidity level trigger

The humidity setting defines at what relative humidity the fan will trigger, adjustable from 50% to 70% rH.



### Comfort mode

Comfort mode changes how the fan boosts. Normally the fan will go into boost as soon as an LS input is detected and over run for the set period when LS is disconnected. In comfort mode the fan will not boost until the LS has been on for 5 minutes, preventing nuisance noise. After 5 minutes of LS being on the fan will run in boost as long as LS is on and for the over run time after LS is switched off. If the LS is switched off before 5 minutes the fan will not boost. This mode does not affect the pullcord operation, pulling the pullcord will still activate boost.

### Lock feature (Revive 5, Revive 7 & Revive Intermittent models)

The lock feature will prevent the unit from being adjusted after commissioning as a pass code is required to access the menu. This can be set in the menu to any 3 digit hexadecimal combination.

If the lock feature is enabled; when a button is pressed the display will show, – – –. At this point enter the three digit code by first pressing + or – until the first digit is correct then press MODE to move to the next digit. Repeat until the code is entered and press MODE to enter the commissioning menu. If the code is entered incorrectly, wait until the screen switches off then press any button to begin again.

### C7 Loft Insulation (or Equal or Approved)

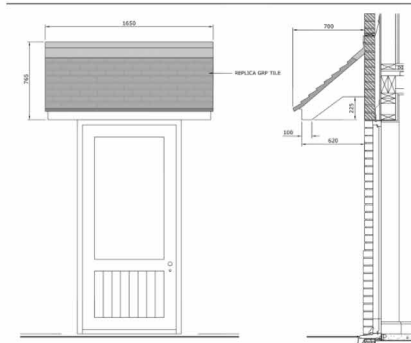
Install 200mm of Knauf Loft Roll 44 Combi Cut between ceiling joist then 200mm on top laid perpendicular to the rolls below



#### Technical specification

Length	6000 mm	Thickness	200 mm
Width	1140 mm	Material	Glass Mineral Wool
Usage	Thermal Loft insulation for a pitched roof at ceiling level only. Standard loft insulation which runs between timber joists and then cross layered on top.	Coverage	6.84 m <sup>2</sup>
Fire Retardant	Y	Acoustic	No
Thermal Conductivity	0.044 W/mK	Pack Quantity	1
Certifications Met	Euroclass A1 Reaction to Fire Classification, Eurofins Gold	Type	Loft Roll
Brand Name	KNAUF INSULATION	Country Origin	UK

**C8 GRP Canopy: Wessex Downton Replica Tile Roof 700mm \* 1650mm (or Equal or Approved) – Where required**



**DOWNTON REPLICA TILE ROOF 700 X 1650**

Code: 10197

Downton door canopy having a feature vaulted ceiling which is ideal for door frames with a glazed fanlight. The ceiling has simulated T & G boarding with a wood grain effect finish to add that extra touch.

**C9 Mould Remover (or Equal or Approved)**



3 in 1 - Kills, Cleans, Protects

- Protects against mould returning
- Kills mould instantly
- Can be applied directly to the paint
- Ready to use
- Perfect for tough cleaning
- Contains biocides to stop mould from growing

**C10 Gable Ladder (roof line extension) – Property will benefit from a new roof**

Guidance on Extending the Roof Line on Domestic Properties to Ensure Sufficient Overhang to Accommodate External Wall Insulation – IAA Best Practice Guide V1.0 December 2022

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**Technical specification**

Weight	0.55 kg	Colour Family	Clear
Colour	Clear	Size	0.5 L
Application Method	Cloth	Interior or Exterior Use	Interior
Washable	No	Clean equipment with	Warm, soapy water
Suitable for	Interior Walls	VOC Level	Minimal
Type	Mould Killer	Country Origin	UK
Brand Name	Ronseal		

### **C10.1 Preface**

This guide provides information relating to best practices for roof line extensions for domestic properties to accommodate the addition of external wall insulation (EWI) as an effective energy efficiency measure.

The guidance offers practical guidance and procedures to be carried out by competent and skilled operatives.

The guide should be followed and used in conjunction with the required standards of technical competence requirements and recommended training programmes. The intention of this guide is to provide a common understanding of the requirements for extending the roof line safely and effectively, to assist installation technicians, installing contractors, supervisory staff, and technical monitoring inspectors.

The consensus for EWI is that where there is insufficient roof overhang the roofline should be extended to accommodate the insulation beneath the roof and avoid the additional risks involved where the uppermost EWI is exposed to the elements. Currently, this Best Practice Guide is an interim user guide to aid and guidance where roof line extensions are required but is not intended to provide confirmation of structural stability or wind loading requirements or used as a designed proposal.

All guidance notes and illustrations are therefore reference points only and any works involved to extend a roof line must be completed by the relevantly skilled and qualified professional tradespersons.

### **C10.2 Existing Warranties**

Prior to any works, existing warranties covering other previous remediation, maintenance or building products, should be checked, and confirmed that roof line extension work does not impact on their ongoing validity.

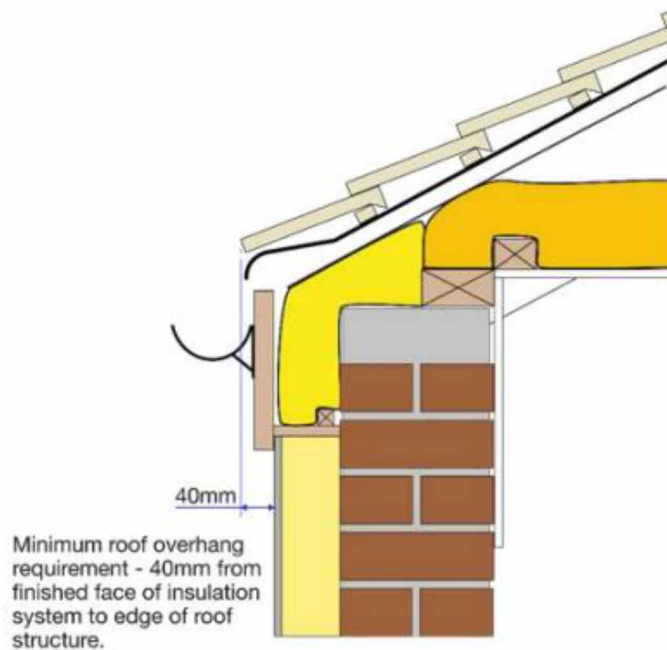
### **C10.3. Adjoining Properties / Party Walls**

**Prior to any works consideration** needs to be given to adjoining properties and the impact the works may have on their building (this could also include access to carry out the works). Party Wall Survey and notice may need to be put in place before works can commence.

### **C10.4. Introduction**

This Guidance on Extending the Roof Line on domestic properties is to ensure sufficient overhang to accommodate external wall insulation document requires that an overhang of at least 40mm from the face of the finished render to the outer edge of the roof structure is required.





*Figure 1 Minimum overhang from roof structure to the finished face of EWI system*

### **C10.5. General Considerations**

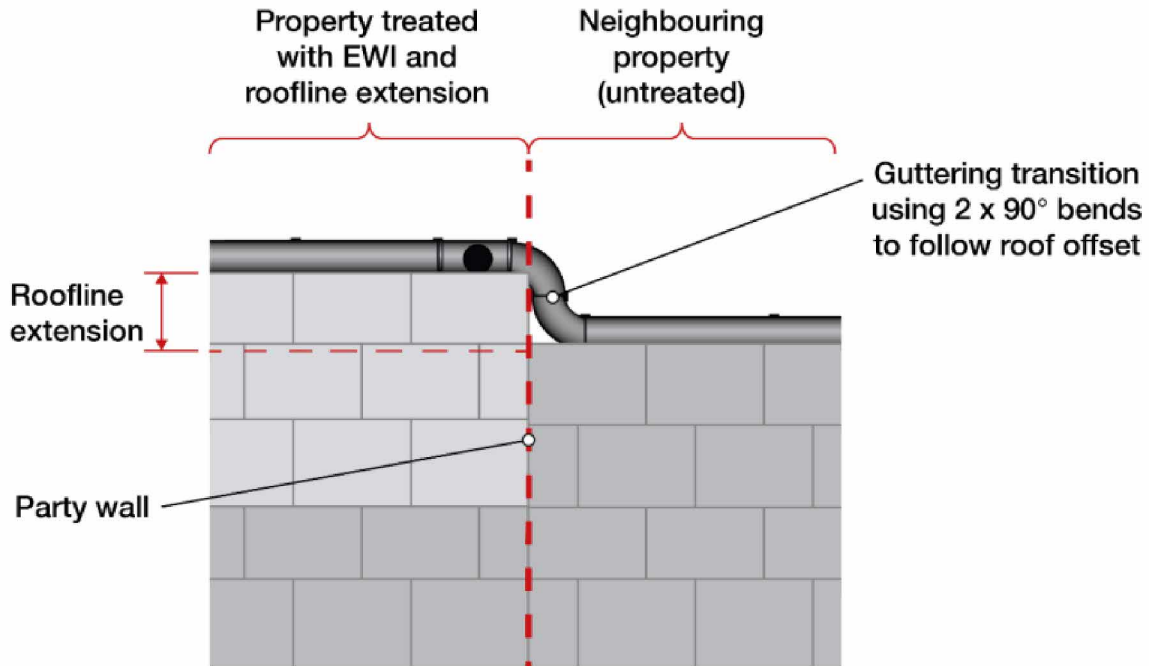
With numerous different scenarios of roof detail, it would not be possible to provide guidance covering every type or style, however, there are several items of consideration that will be applicable to most roof line extensions.

**Minimum Overhang Following EWI** industry best practices any modification to rooflines whether for gable ends, eaves, or flat roofs, should be designed to ensure that there is a minimum overhang of 40mm between the face of the finished render and the outer edge of the modified roof structure. Figure 1 Minimum overhang from roof structure to the finished face of EWI system

**Rainwater goods** In every instance rainwater guttering and downpipes will require re-positioning when a roof line is to be extended, and this must consider whether pre-existing rainwater goods are fit for purpose and can be relatively easily adapted and re-fitted to remain fully operational.

Pre-existing cast iron rainwater guttering, and downpipes are highly unlikely to be removed and re-positioned without damage and the additional weight of this style of rainwater drainage to a roof line extension does also present further risk of weight overloading. It is also likely that the fitment of EWI would be enhanced with modern, plastic lightweight guttering which is much easier to fit and position and highly likely that the entire pre-existing cast iron rainwater system would need to be replaced during EWI and roof line extension works. If this is the case then consideration also needs to be given to any adjoining buildings with shared rainwater guttering, ensuring the works do not impact their functionality and where re-connection is required between different materials and styles a robust solution / product is available to do this.

Where the roofline has been extended on a dwelling sharing a party wall to an untreated property, the extended guttering shall be connected to the guttering on the neighbouring property by means of a stepped connection, using two 90° bends as illustrated in the plan view - figure 2 below.



*Figure 2 Gutter works required for a terraced property.*

**Compatibility** Extending a roof line will require additional tiles, shingles, slates or leading along with new fascia and soffit boards and it is vital that all additional component parts are sourced to match as closely as possible to the existing roof design, construction, textures, and colours.

**Loft Cross Flow Ventilation** Where loft ventilation is being provided by soffit ventilation points, care should be taken where extending the roofline to ensure sufficient ventilation is provided by the extended construction, with vents being positioned as close to the outer edge of the soffit board as possible to ensure a continuous flow of air to every rafter line. Where loft insulations required to be extended over EWI to prevent thermal bridges an air gap of at least 25mm should be provided between the top of the insulation and the roof underlay. This can be achieved by installing ventilation trays or baffles, please refer to Figure 6 for an overview of this.

**Restrictions and limitations** Buildings of architectural significance or listed building are highly unlikely to gain approval for EWI on front-facing facades but may be suitable for EWI on other elevations. In these circumstances a Hybrid EWI/IWI would be a sensible approach, meaning that roof line extensions would only be required for the EWI treated elevations. Terrace rows where pedestrian pathways are directly adjacent to the front elevation may not always be suitable for EWI at least on the front elevation but once again these may be suitable for a Hybrid installation process.

**Wind loading and roofline design** This aspect of a roof line extension must be appropriately assessed by a qualified professional with consideration of orientation, exposure, roof detail, adjoining building etc to ensure a robust design with appropriate fixing method is fully adopted.

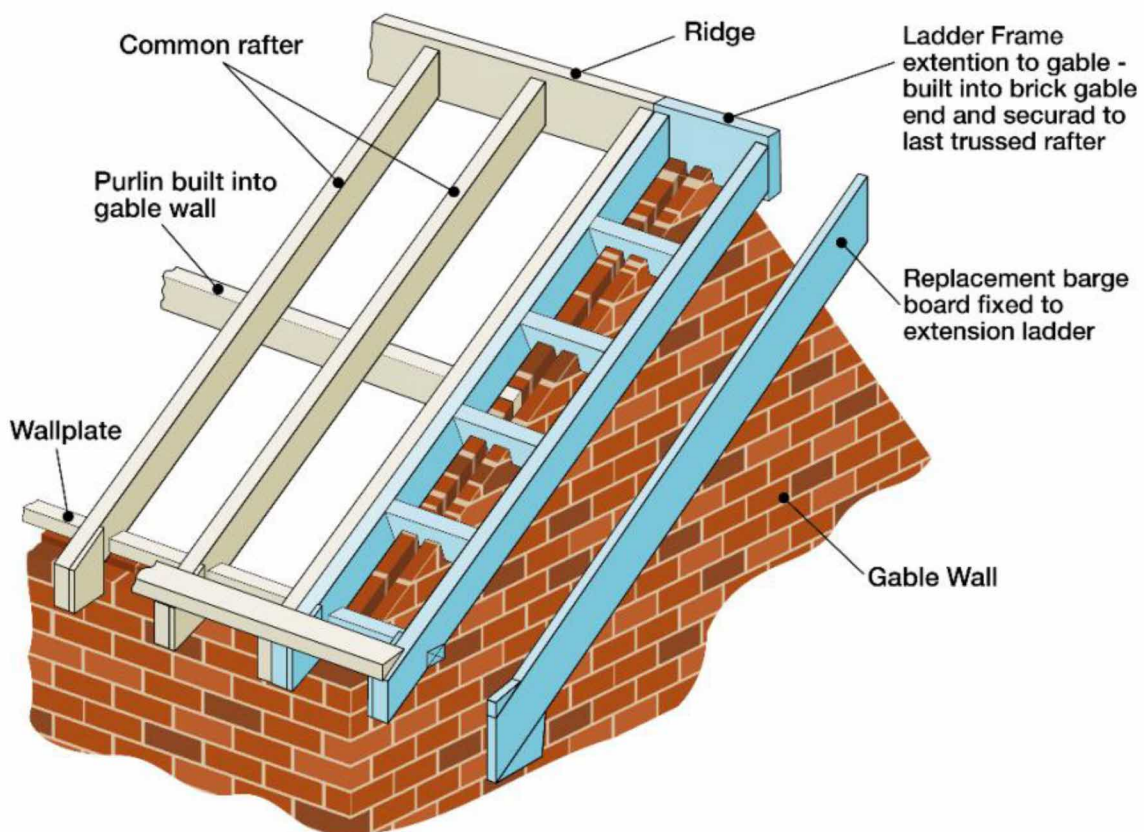
**Flat roof** Where there is a requirement to extend the roof line on a flat roof, this should be completed in a manner similar to that explained for verge roofline extensions, detailed in this document. Rainwater guttering and fixings will need to be considered along with an extension of the existing weather-protective flat roof outer layer.

**Thermal bridges** With every additional thermal efficiency measure installed, cold or thermal bridges become more susceptible to condensation and mould spore development, and it is vital that these are considered, and risks mitigated. Continuity of insulation from loft insulation to EWI is essential and where possible insulation compacted into all areas of the uppermost masonry, to ensure cool external air cannot penetrate below the insulation.

**Gable ends and ridges** Depending on the age of the property, by exposing timber rafters and steel trusses (in the instance of a steel-trussed roof), there may be timber or steel deterioration to the uppermost edges, which would not have been visible from inside the roof space and usually identified where the chimney exits the roof space.

Should this be the case, it is essential that moisture levels are assessed and confirmed to be at an acceptable level (i.e., ideally less than 18% and existing roof timbers are in appropriate and suitable conditions for roof line extension timbers to be firmly anchored and securely fixed.

Once again depending on age and construction, it may be necessary to remove roof line bricks at regular intervals for the positioning of right-angled bracing timbers along the entire roof line through the gable wall



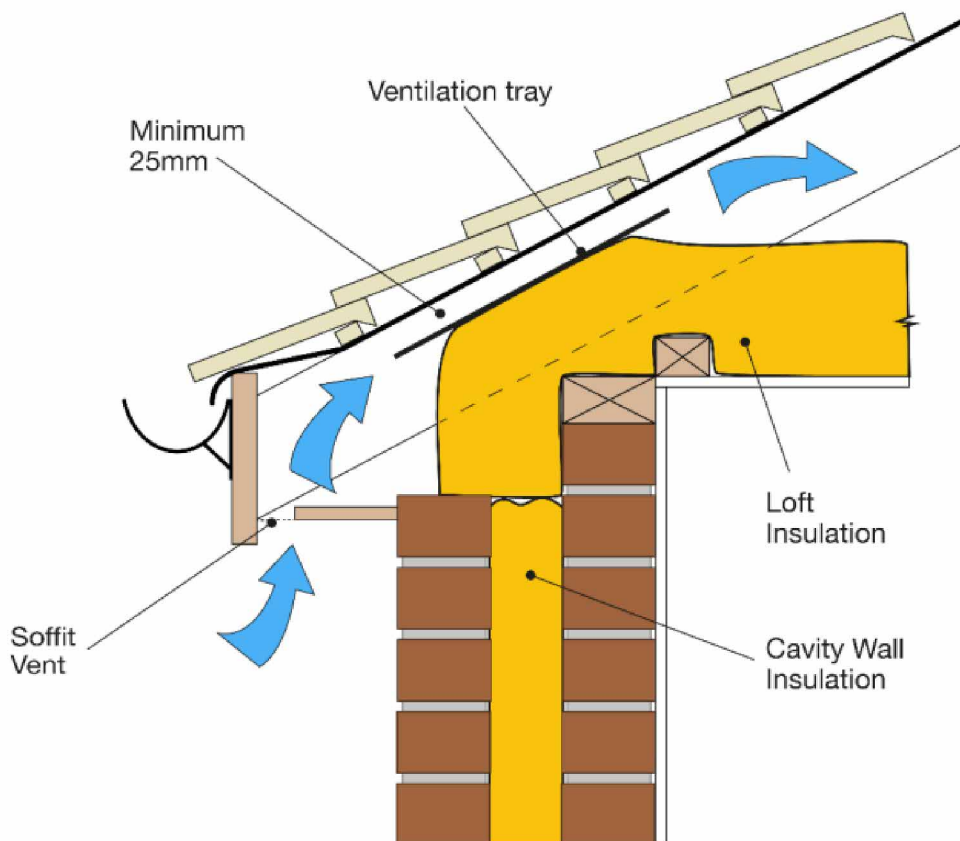
*Figure 3 Example of Gable End Roofline Extension Using a Ladder Frame*

**Fixed ventilation spacer / tray** Loft insulation once unrolled from its compressed and transportable condition will recover to its design thickness and beyond.



With extended eaves ventilation and roofline, it would be entirely likely that loft insulation would recover rapidly to completely block eaves ventilation if there is no permanent fixture to ensure the ventilation gap remains unobstructed.

A fixed ventilation spacer or tray above the insulation is therefore essential to provide a minimum gap of 25mm between the insulation and roofing felt when extending a roof line to ensure adequate loft ventilation is maintained.



*Figure 4 Loft ventilation maintained using a ventilation tray*

**Hipped roof** This style of roof construction may present additional challenges at corner junctions, particularly if there are rainwater valleys draining into guttering or directly into downpipes. Should there be a scenario where existing rainwater drainage from a valley drains directly into a downpipe and this limits re-positioning of rainwater goods, the property may not be suitable for EWI alone and may require a Hybrid solution.

#### **Extending roofing felt**

Depending on weather conditions, from time to time most loft spaces will allow condensation droplets to form on the underside of roofing felt in localised areas, and then the slightest ventilation and moving air, sufficient to evaporate moisture droplets. However, extended periods of still air and frosty conditions through winter months may exacerbate these conditions to the point where there is sufficient moisture accumulation to begin to drain down roofing felt inside the roof space and into the soffit area where the roof line extension terminates.

Without adequate provision to also extend the roofing felt beyond the outer edge of EWI, there is always a possibility of moisture droplets draining behind the EWI with the likely consequences of internal dampness and failed EWI.

The following image shows a support tray terminating on the outer edge of the roof line where EWI would also terminate.

**D8.6. Roof Line Extension** EWI provides a significant thermal upgrade and weather protects the outer wall surface, and an extended roof line ensures the insulation remains beneath the roof protection, avoiding water ingress and the inevitable failure of the EWI system.

Roof line extension at eaves level, and for hipped roofs, will be relatively straight forward once the lower edges of roof timbers are exposed, with the first two or three runs of roof tiles removed and roofing felt peeled back. However, gable ridges present far more difficult challenges to overcome, and at the same time needing to confirm the roof extension is secure to wind loading and is sufficiently robust to withstand weathering for the lifetime of the building.



*Figure 5 Extending Roofing Felt*



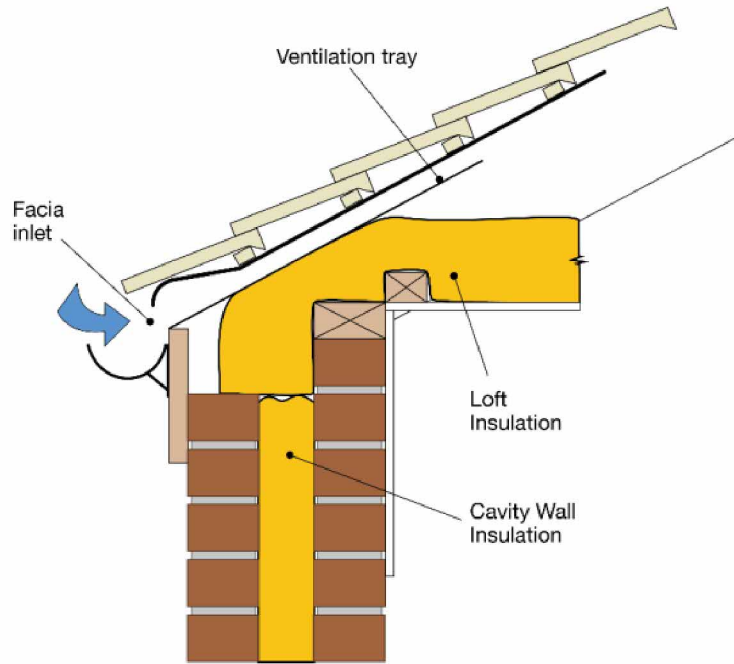
Figure 7 Roof eaves being extended example (Ref BRE External Wall Insulation (EWI) Report P107357-1000)



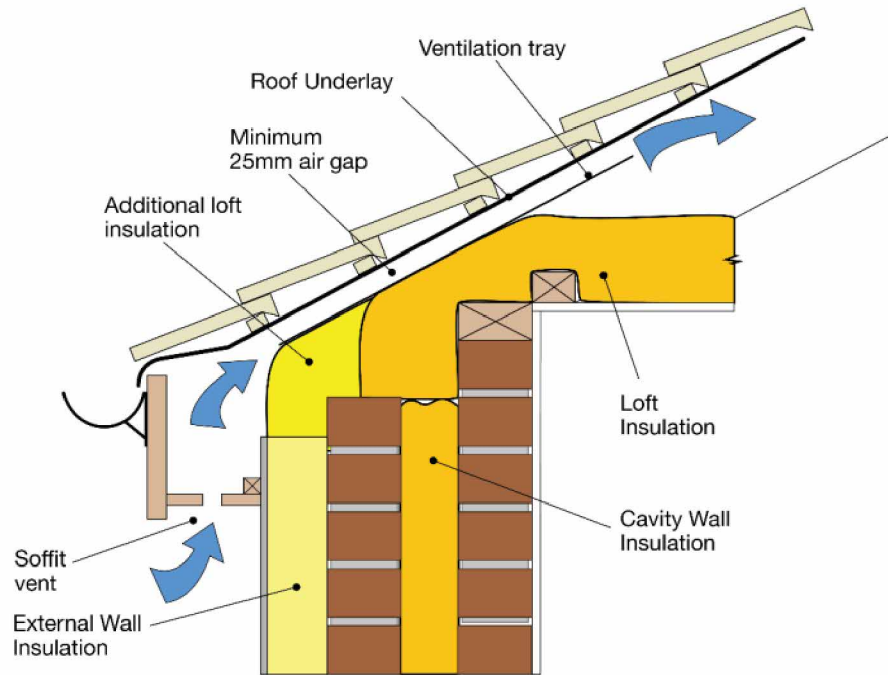
Figure 6 Eaves Roofline Extension Example



### Standard Eaves Extension Detail on Cavity Wall



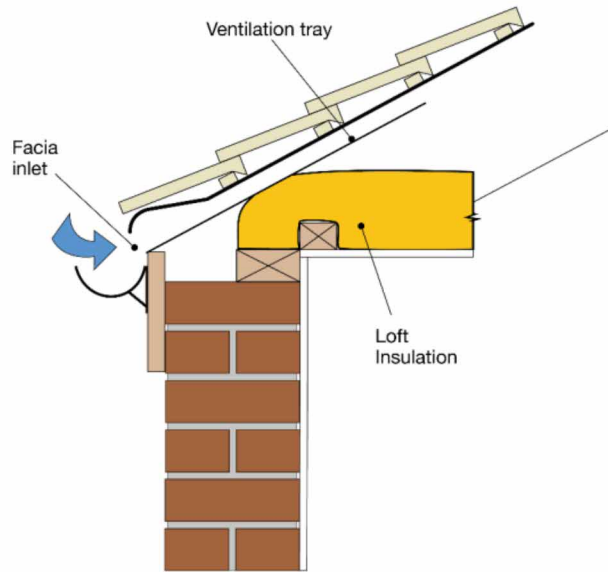
*Figure 8 Standard Eaves Detail on a cavity wall construction without external wall insulation (EWI)*



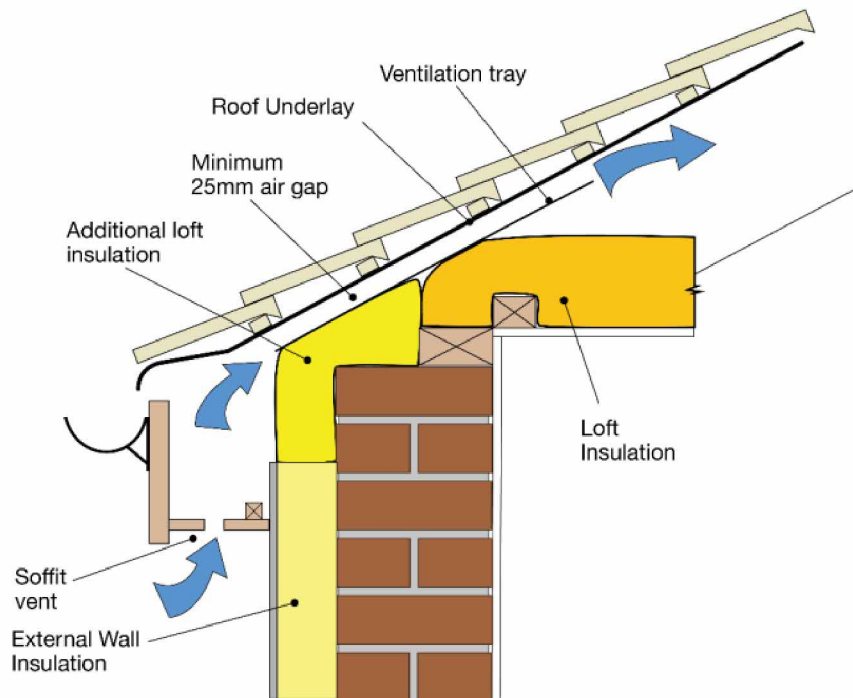
*Figure 9 Standard Eaves with Roofline Extension to provide suitable overhang whilst maintaining adequate loft ventilation with additional loft insulation added to mitigate the thermal bridge on the outer brick leaf.*

Additional loft insulation should be added in the eaves, connecting the existing loft insulation to the external wall insulation to prevent any potential thermal bridges.

**Standard Eaves Extension Detail on Solid Wall**



*Figure 10 Standard Eaves Detail on a solid wall construction without external wall insulation (EWI)*



*Figure 11 Standard Eaves on a solid wall with Roofline Extension to provide suitable overhang whilst maintaining adequate loft ventilation with additional loft insulation added to mitigate the thermal bridge.*

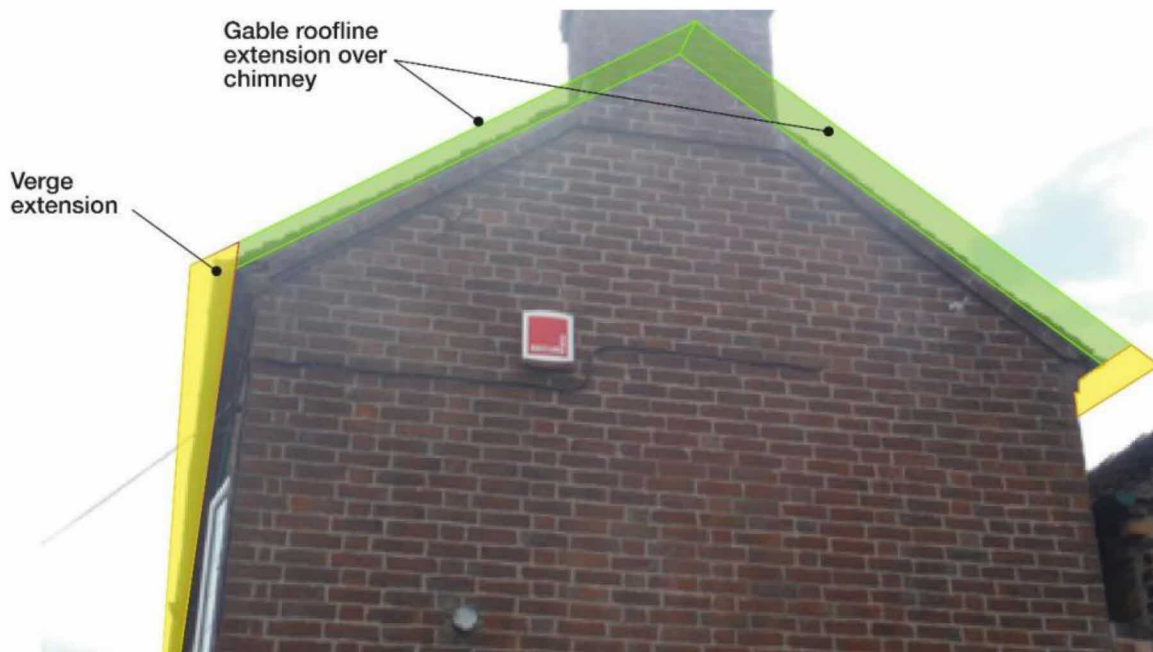


**Internally constructed chimneys** The digital image in Figure 12 shows an internally constructed chimney at the gable end, with external brickwork extending above the roof line, and in this regular scenario EWI would have previously terminated horizontally at roof level with the use of a verge trim.

This scenario will now require the roofline to be extended around the chimney (illustrated in green) effectively creating a small ridge section on the outer face of the chimney to allow the EWI to butt up against. Horizontal lead flashing should be fully embedded into the chimney brickwork, compacted, and sufficiently overlapped to ensure a watertight finish to be fully weather protected on the exposed chimney section, eliminating the risk of water ingress behind the EWI.

It is vital that during the works to fit lead flashing to the chimney surround, any mortar joint or brickwork deterioration is fully and completely rectified to ensure there is sufficient water drainage from the chimney itself.

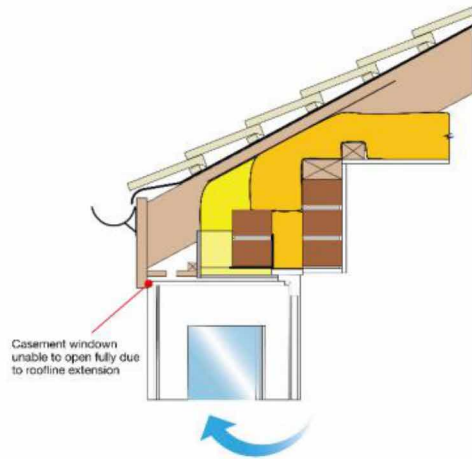
Depending on exposure and orientation it may also be appropriate to treat the exposed chimney brickwork with a weather protective coating as a secondary measure.



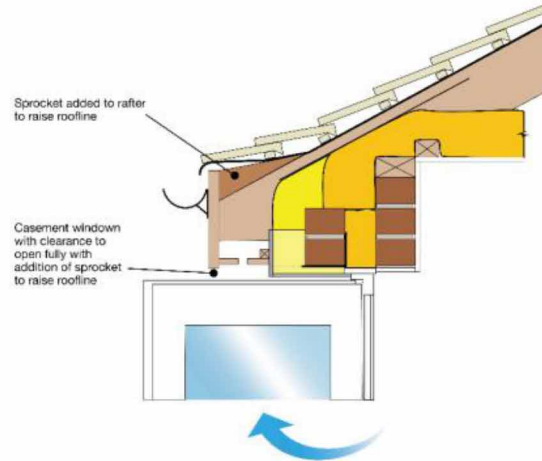
*Figure 12 Gable End Roofline Extension Encasing Chimney*

## Extending the eaves on dwellings with casement windows

A casement window is a window that is attached to its frame by one or more hinges at the side. They are used singly or in pairs within a common frame, in which case they are hinged on the outside. When extending the roofline on a property with casement windows, care must be taken to ensure that the extended (and potentially lowered) eaves do not interfere with the opening of the window.



*Figure 13 Extended eaves prevent window from opening*



*Figure 14 Sprocket added to rafter to raise the position of the eaves to allow clearance for the window*

In some cases, it may be necessary to raise the eaves by fitting sprockets on the upper edge of the rafters (figure 14) along the length of the extended roofline. This will enable the eaves to be raised to provide the clearance required for the casement windows.

**New build roofs** New build roofs are always constructed to sufficiently overhang, protecting the building from water damage below the roof line, with reinforced timber noggins at right angles for strength and stability for gable end walls.

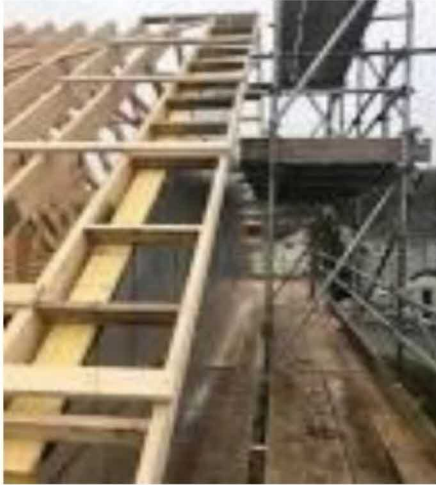


*Figure 15 New build roof structure*

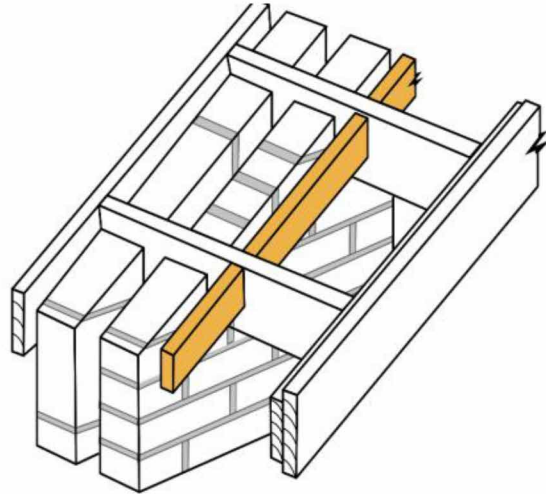
With so many scenarios and differing challenges to overcome with regards to existing buildings and features, the following images simply show a standard fixing method for roof line extension with horizontal bracing boards in a ladder effect, either embedded into the masonry roof line, alternatively, if there is available space laid directly above the masonry roof line.

- Rafters not to exceed 600mm centres
- Horizontal bracing (ladder) at 600mm centres
- Roofing felt to extend up to and draped down to the inside of the bargeboard
- Guttering to be extended to the end of the extended roof line





*Figure 16 Roof ladder construction*



*Figure 17 Roof ladder construction illustration*

Where gable ridges require a roof extension and there are no barge boards and the roof line terminates with a minimal overhang, as the following examples 1 & 2 show, the roof line must be extended to a minimum 40mm overhang beyond the proposed EWI.

By removing the first two or three lines of roof tiles and peeling back roofing felt to expose the timber rafters, timber battens can be placed and extended to overhang beyond the gable wall by a minimum 140mm, allowing sufficient overhang to accommodate EWI with a 40mm overhang beyond the insulation.

Should the proposed method of embedding the horizontal ladder bracing timbers through the masonry not be an appropriate or practical, metal brackets could be mechanically fixed to the outer roof line masonry and battens extended from the existing roof detail. However, with so many scenarios, obstructions, roof detailing and existing features to overcome, every roof line extension will inevitably be different and will require a full assessment by a relevantly qualified professional prior to any works to ensure the roof line extension is fit for purpose.

**Example 1**



*Figure 18 Gable end with flat parapet roof section*

**Example 2**



*Figure 19 Gable end with insufficient overhang for EWI*

### C8.7. Ventilation

Extending a roof line at eaves level to accommodate EWI will inevitably affect ventilation to the roof space, and it is essential that any works make adequate provision to maintain permanent cross flow eaves ventilation.

Positive air pressure through eaves ventilation on one side of a property generates negative pressure on the opposite side of the property inside the roof space, forcing moist stale air to be regularly and continually replaced with dry air, and this process is sufficient to remove any build-up of moisture droplets inside the roof space.

With ever increasing thicknesses of loft insulation, roof spaces are less likely to allow warm air to escape from the living area into the roof void and moisture droplets less likely to form. However, the vast majority of roof spaces rely solely on eaves ventilation, and it may be necessary to make further provision for roof space ventilation by fitting either tile vents or lap vents and in some circumstances ridge vents may be necessary, alternatively, simple easi-vents may be a solution to permanently hold roofing felt slightly open.

Retrofit works must also consider thermal bridges and ensure there is continuity with insulation measures whilst maintaining cross flow ventilation.

Insufficient provision to eliminate thermal bridging at eaves level will inevitably increase the risk of décor discoloration and possibly condensation and mould growth, and despite the limited ventilation gap at eaves level, high density rigid insulation allows a reduced thickness to maintain a consistent thermal performance throughout, avoiding thermal imbalances.

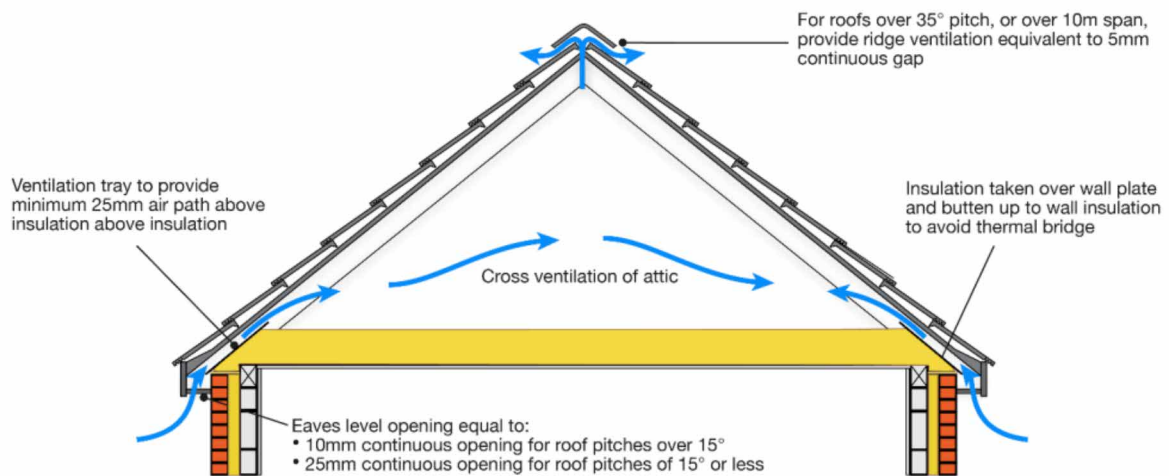
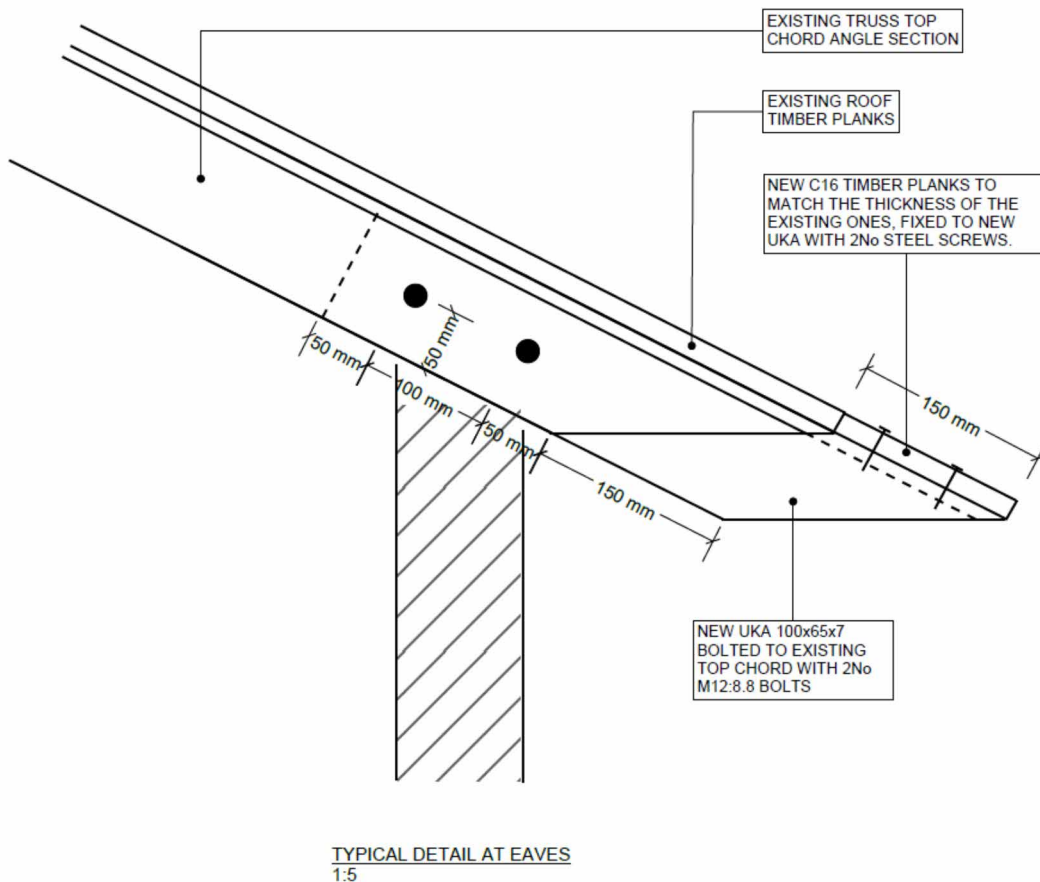
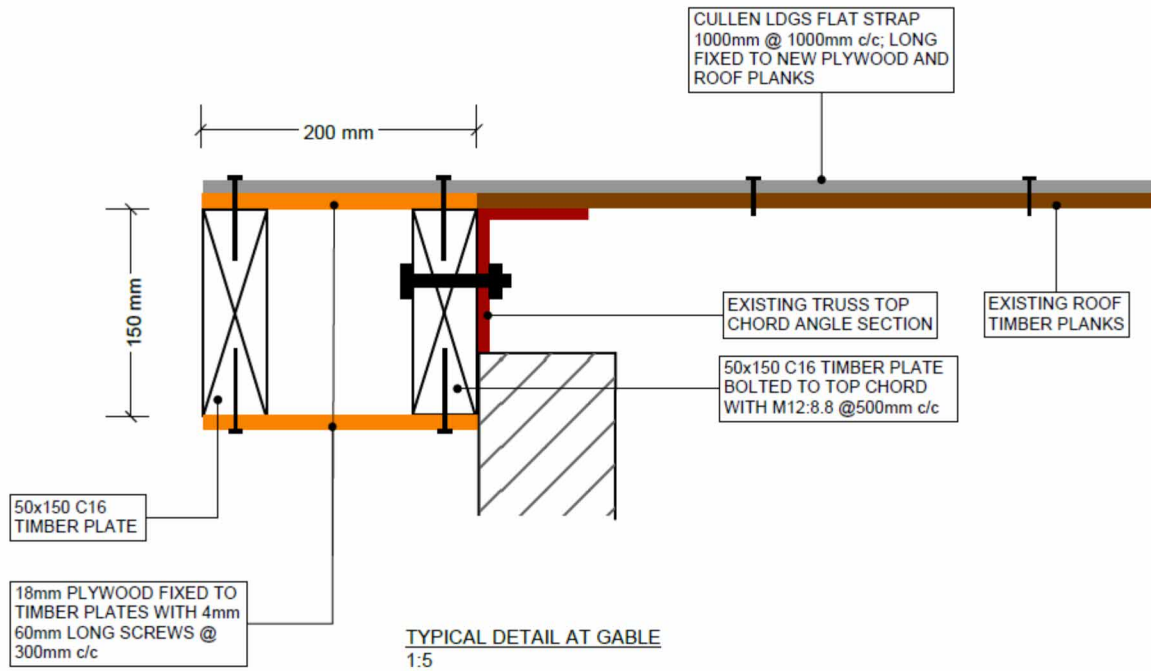
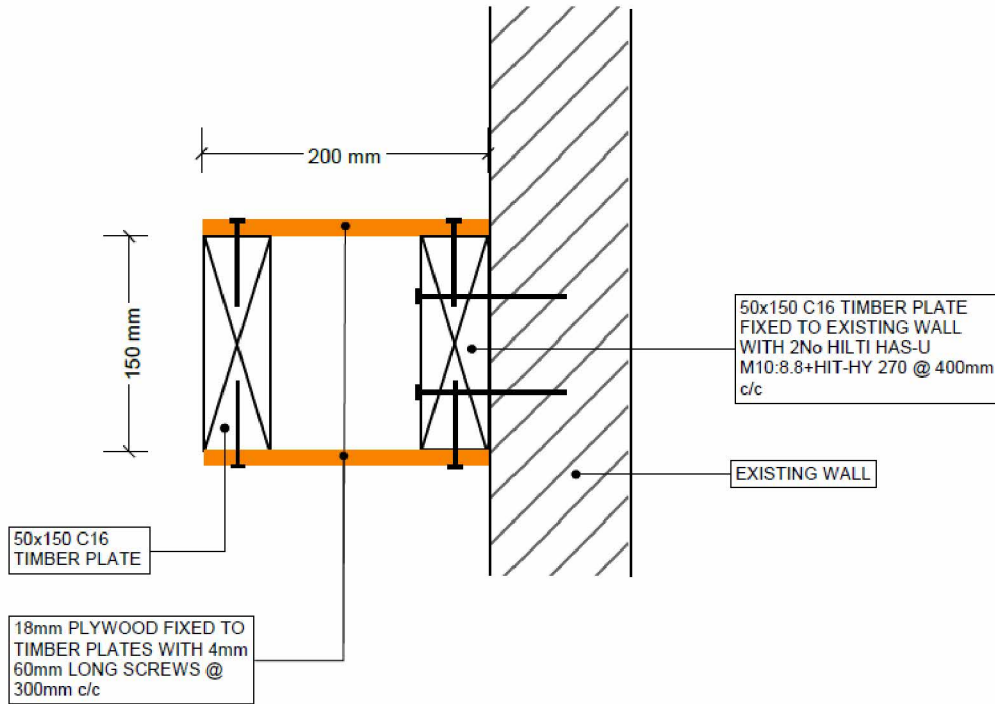


Figure 10 Summary of loft ventilation requirements in accordance with BS5250:2021

### C8.8 Dorlonco Steel construction roof detail



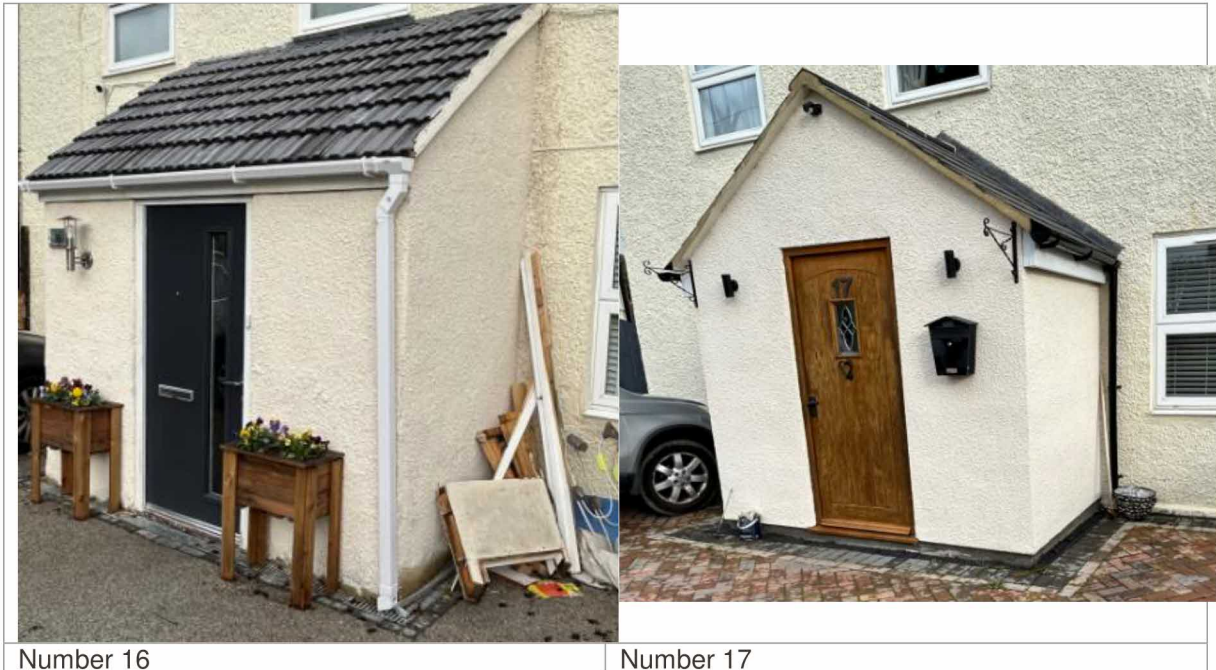




**TYPICAL DETAIL AT GABLE CHIMNEY**  
1:5

### C8.8 Porches

Properties 16 and 17 feature brick built permanent porch structures. Porch specification as per above from page 26.



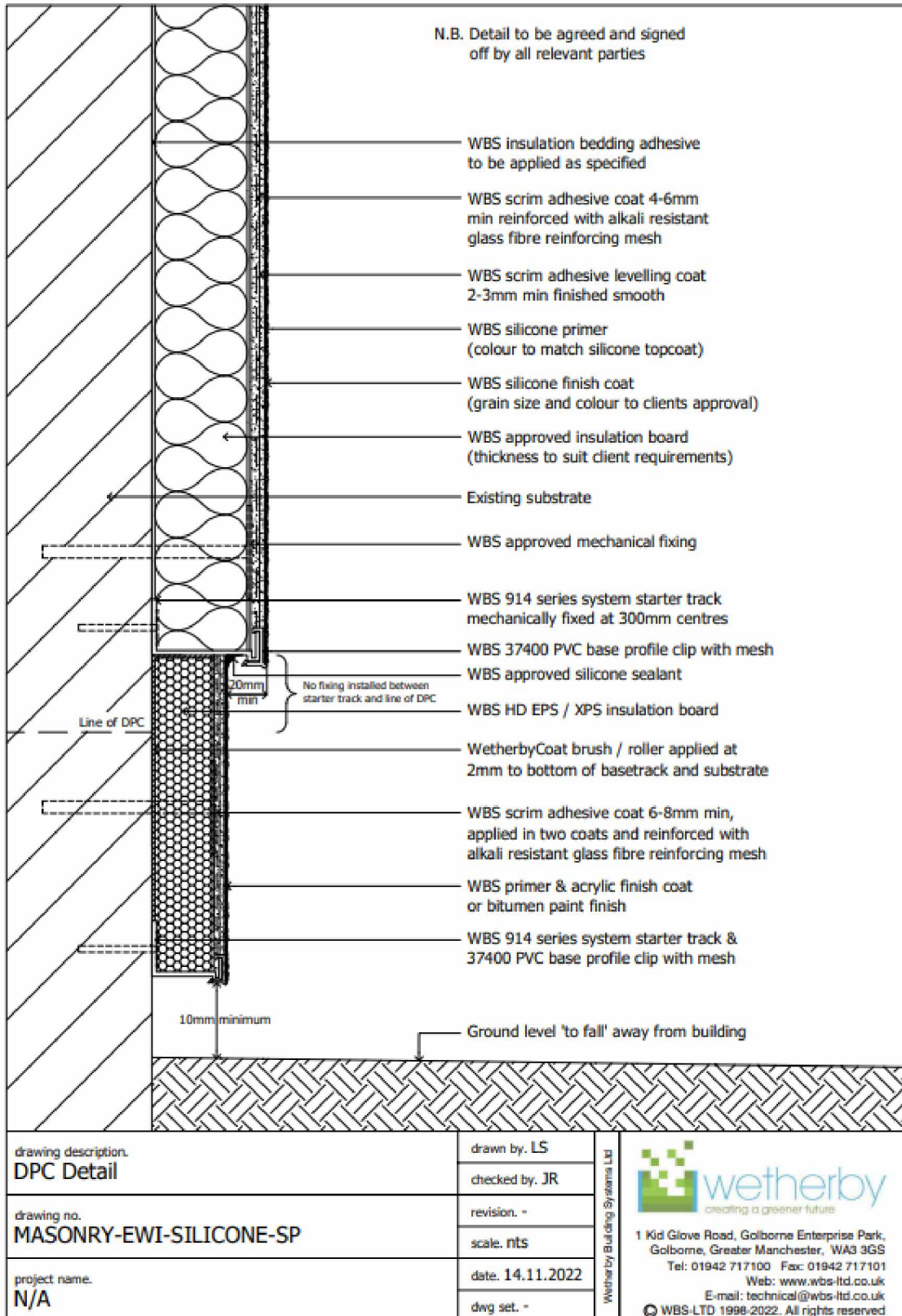
### C8.9 ACO Drains

Several properties feature ACO drains abutting or close to the property wall.

The example below is at Number 17 on the front elevation:



DPC detail:





## C9. Health & Safety

Any modifications to the roof of a property will present a number of significant hazards, including working at heights. The installer must liaise with a suitable qualified Health and Safety Officer to ensure consideration is given to the following as a minimum:

- Working at height is assessed and planned, paying due consideration to:
  - o Safe access and egress to roofs
  - o Roof edges and openings
  - o Fragile surfaces
- Planning safe systems of work
- Contractor/employee competency
- Preparation of Site-Specific Risk Assessments, Method Statements and Construction Phase Plans
- Suitable PPE/RPE
- Electrical Safety
- Emergency arrangement

### C9.1. Building Regulations

The following renovation works are subject to Building Regulations.

When applying a new layer (e.g., cladding) or rendering the external surface of the thermal element, or where the external appearance of the building changes.

In the case of walls, the thermal element refers to a wall that separates the heated part of the building from the external environment.

This means that all external wall insulation is therefore notifiable with Building Control

Example: Building Control Notice (See planning portal for correct application / notification document for EWI)



**AF-01 v1 - Building Regulations Application Form**  
The Building Regulations 2010

Please indicate Application type:  Alterations  Extension  New build  Conversion  Other

**1 Applicant details**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Postcode: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

**2 Agents details**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Postcode: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

**3 Location of site to which the building work relates**

Address of site: \_\_\_\_\_  
Postcode: \_\_\_\_\_

**4 Proposed / Completed works**

Description of proposed / completed building work:  
\_\_\_\_\_  
\_\_\_\_\_

Plan Change:	E	+ E	WMT + E
Step Change:	E	+ E	WMT + E

**5 Declaration**

This application is submitted in relation to the building work as described above. It is submitted in accordance with Regulations 1(2)(i) and 1(8) where relevant and is accompanied by the appropriate charge.\*

I understand that further applicable charges (such as inspection fees) may become payable by the building owner following the first inspection undertaken by the local authority.

I / we apply for Full Plans Building Regulation Approval / Building Notice Acceptance / Registration Certificate / Parting Application as described on this form and as detailed on any supplementary documents.

Signature: \_\_\_\_\_ On behalf of: \_\_\_\_\_  
Date: \_\_\_\_\_

External wall insulation must adhere to building regulations.

For pitched or flat roofline extensions, approval under the Building Regulations is likely to be needed to ensure the roof will be adequate in terms of structural stability.

Detailed information must be sought from the local authority planning office before commencing the planned works.

When solid wall insulation is installed on the external walls of the building/dwelling, it must adhere to current building regulations. In this case, it is referring to the thermal performance of the insulation; the solid wall insulation must achieve a U-value of 0.30 watts/m<sup>2</sup>K

#### **D Contractor Competence**

Installation of EWI must be carried out by an approved Installer recommended or recognised by the holder of the BBA certificate for the ETICS. The Installer must:

- Undertake to comply with the installation procedures specified by the holder of the BBA certificate;
- Employ operatives trained and approved by the holder of the BBA certificate, working in teams each containing at least one operative trained by the holder of the BBA certificate;
- Be subject to at least one inspection per year (including unannounced inspections) by the holder of the BBA certificate to confirm that suitable site practices are being employed.
- EWI installations are to be strictly in accordance with the designs reviewed by the Retrofit Coordinator and be consistent with the guidance in Best Practice Guide: External Wall Insulation published by the Insulated Render and Cladding Association (INCA) in 2015.

**E1 Additional Property Photographs**

**Number 11:**



**Number 12:**



**Number 13:**





**Number 14:**



**Number 15:**



**Number 16:**





**Number 17:**



**Front Elevation**



**Side Elevation**



**Rear Elevation**

**Number 18:**



**Front Elevation**



**Side Elevation**



**Rear Elevation**

