

ARMOURCOAT®

SUSTAINABLE LUXURY FINISHES

TECHNICAL DOCUMENT

POLISHED PLASTER SELECTOR RANGE - SMOOTH INTERNAL/EXTERNAL



CONTENTS

A. POLISHED PLASTER SELECTOR RANGE - SMOOTH INTERNAL

1. PRODUCT DESCRIPTION	4
1.1. PRINCIPAL INGREDIENTS FOR SMOOTH	5
<hr/>	
2. TEST DATA	5
2.1. FIRE TESTING	5
2.2. VOLATILE ORGANIC COMPOUND (VOC) TESTING	5
2.3. MOULD/MILDEW RESISTANCE	7
2.4. SHORE D HARDNESS	7
2.5. PENCIL HARDNESS	7
2.6. SCRUB RESISTANCE	7
2.7. COMPRESSIVE STRENGTH	7
2.8. ENVIRONMENTAL PRODUCT DECLARATION (EPD)	7
2.9. HEALTH PRODUCT DECLARATION (HPD)	8
2.10. LIVING BUILDING CHALLENGE (LBC)	8
<hr/>	
3. SUITABLE SUBSTRATES	8
3.1. SUBSTRATE SPECIFICATION FOR PLASTERBOARD AND DRY LINING INSTALLATION	8
3.2. PLASTERBOARD FINISHING	9
3.3. PLASTERING	11
3.4. DIAGRAMS	12
<hr/>	
4. CARE AND MAINTENANCE	21
4.1. CLEANING SURFACE DIRT AND GRIME	21
4.2. CLEANING SCUFF MARKS	21
4.3. STUBBORN MARKS	21
4.4. REPAIRS	21
4.5. GENERAL MAINTENANCE	21
<hr/>	
5. WARRANTY	21

B. POLISHED PLASTER SELECTOR RANGE - SMOOTH EXTERNAL

1. PRODUCT DESCRIPTION	22
1.1. EXPECTATIONS AND LIMITATIONS	23
1.2. SURFACES	23
1.3. COLOUR	23
1.4. OVERHANGS AND SOFFITS	23
<hr/>	
2. TEST DATA	24
2.1. EUROPEAN FIRE TEST RESULTS	24
2.2. HYGROTHERMAL TESTING	24
2.3. LIVING BUILDING CHALLENGE (LBC)	25
<hr/>	
3. SUITABLE SUBSTRATES	25
3.1. BRICK, BLOCK AND CONCRETE	25
3.2. CEMENT BOARD	26
3.3. EWI SUBSTRATES	26
3.4. BUILD QUALITY	28
3.5. FIXING	28
3.6. BEADING	30
3.7. DIAGRAMS	31
<hr/>	
4. CARE AND MAINTENANCE	48
4.1. CLEANING	48
4.2. INSPECTION	48
4.3. DAMAGE AREAS	48
<hr/>	
5. WARRANTY	48

TECHNICAL DOCUMENT

A. POLISHED PLASTER SELECTOR RANGE - SMOOTH INTERNAL

1. PRODUCT DESCRIPTION

Smooth is a mid-sheen finish with visible marble grain and subtle tonal variation across the surface. The Smooth polished finish is like marmorino, which was used extensively in northern Italy during the Renaissance period and beyond as an internal and external wall finish and as a background for the ornate frescoes which dominated much of the decoration of that time.

Armourcoat Smooth is created using our standard powders P01, P30 and P66, for the purpose of this document we will refer to them as "P01+".

Armourcoat P01+ is a natural mineral material composed of hydrated lime, crushed marble and cement combined with special additives to control working characteristics.

Although essentially of the same composition the three base powders P01, P30 and P66 are made up from different proportions of white, yellow, red and green crushed marble powders.

This means a range of natural stone-coloured finishes can be achieved without the addition of any pigment.

Properties

- Natural mineral material
- Natural breathable finish
- Good water vapour permeability
- Seamless and durable polished surface for interiors
- Wide range of Concrete colours
- Up to 29% recycled content
- A2 fire Classification
- Low embodied carbon
- Zero VOC content
- No Off gassing
- Environmental Product Declaration
- Health Product Declaration
- LBC Red List Compliant

1.1. PRINCIPAL INGREDIENTS FOR SMOOTH

Many of our finishes are made up from different components. This is a list of the principal components that make up the Smooth finish.

PRODUCT	QUANTITY (KG/M ²)	VOC (G/L)	GWP/M ² CO ₂ e
Keycoat	0.65	<1	0.25
P01+	1.80	<1	0.61
Total	2.45	<1	0.86

2. TEST DATA

Polished Plaster has been subjected to a wide range of Fire, VOC, durability, and other performance testing.

2.1. FIRE TESTING

2.1.1. European Fire Test Results

Independent tests were carried out in the UK for classification of reaction to fire performance in accordance with EN13501-1:2018.

REACTION TO FIRE CLASSIFICATION
A2 - s1, d0

2.1.2. American Fire Test Results

Test carried out in accordance with ASTM E84 - 98, Standard Test Method for Surface Burning Characteristics of Building Materials.

TEST TYPE	RESULT
Flame Spread Index	10
Smoke Development Index	10
Flame Spread Classification	1

2.2. VOLATILE ORGANIC COMPOUND (VOC) TESTING

2.2.1. VOC Content testing

A sample of Armourcoat P01+ was tested by an accredited European laboratory (Eurofins) to ASTM D2369, Standard Practise for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

Test Result

TEST METHOD	VOC (G/L)	VOC (LBS/GAL)	LIMIT OF DETECTION (G/L)
ASTM D2369- 2020	<1	<1	1

Evaluation of result

TEST METHOD	CONCLUSION	VERSION OR PROTOCOL
SCAQMD Rule 1113	Pass	February 2016
LEED v4.1 (VOC Content)	Pass	February 2021

2.2.2. VOC Emissions Testing

A sample of Armourcoat P01+ was tested by Eurofins to a wide range of emissions standards including EN 16516, ISO 16000-6, AgBB and French and Belgian VOC regulations.

Evaluation of results

REGULATION OR PROTOCOL	CONCLUSION	VERSION OF REGULATION OR PROTOCOL
French VOC Regulation	A+	Decree of March 2011 (DEVL1101903D) and Arrêté of April 2011 (DEVL1104875A) modified in February 2012 (DEVL1133129A)
French CMR Components	Pass	Regulation of April and May 2009 (DEVP0908633A and DEVP0910046A)
Italian CAM Edilizia	Pass	Decree 11 October 2017 (GU n.259 del 6-11-2017)
ABG/AgBB	Pass	Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (June 2021)
Belgian Regulation	Pass	Royal decree of May 2014 (C-2014/24239)
Indoor Air Comfort®	Pass	Indoor Air Comfort 7.0 of May 2020
BREEAM International	Exemplary Level	BREEAM International New Construction v2.0 (2016)
LEED v4.1 BETA	Pass	February 2021

2.2.3. Environments Building Certification

BREEAM International – Exemplary status for VOC Emissions

LEED ASTM D2369- 2020 V 4.1 certified as a ‘Low emitting Materials’

Full Certificates supplied on Request.

2.3. MOULD/MILDEW RESISTANCE

ASTM D 3273 Standard Test Method for Resistance to Growth of Mould on the Surface of Interior Coatings in an Environmental Chamber.

ASTM D 3274 Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation.

PLASTER	FINISH	POST TREATMENT	FRONT PANEL	BACK PANEL
Armourcoat Polished Plaster	Smooth	Aquawax	10/10/10	10/10/10

*Rating system: 1 is very poor. 10 is no growth.

Testing was carried out by an accredited American testing laboratory.

2.4. SHORE D HARDNESS

A test panel of Armourcoat Polished Plaster X0081 on 6mm MDF was tested for hardness using an Sauter HBD100-0 Shore Durometer D. An average of 5 readings was taken. Tests were carried out at 23°C and 35% RH.

SAMPLE	ARMOURCOAT POLISHED PLASTER X0081
Shore D Hardness	64

2.5. PENCIL HARDNESS

Armourcoat Polished Plaster P01 samples were tested in accordance with ASTM D 3363 using a set of Berol turquoise hardness pencils.

SAMPLE	ARMOURCOAT POLISHED PLASTER P01
Pencil Hardness	5H+

2.6. SCRUB RESISTANCE

The following performance test was performed by an American laboratory and consequently the results are quoted to American Standard Modified ASTM D 2486. 10 grams of scrub medium and 5 grams of water were applied to the brush. The test was halted after 10,000 cycles. After 10,000 cycles the Armourcoat P01+ had not worn through to the undercoat. The lab considers that for a wall coating Armourcoat P01+ is exceptionally hard.

2.7. COMPRESSIVE STRENGTH

Armourcoat P01+ 28N/mm.

2.8. ENVIRONMENTAL PRODUCT DECLARATION (EPD)

In accordance with ISO 14025, ISO 21930 and EN 15804 - The International EPD® System. Core environmental impact indicator EN 15804 +A2 PEF (All categories Cradle to grave).

EPD – P01+

Global Warming Potential (GWP) 0.340kg CO₂e

Coverage rate 1.5-2.5 kg/m²

GWP per m² 0.24 – 0.34 kg CO₂e / m²

EPD – Keycoat

Keycoat - Global Warming Potential (GWP) 0.41kg CO₂e

Coverage rate 0.5-1 kg/m²

GWP per m² 0.2 – 0.41 kg CO₂e / m²

Full EPD can be downloaded from our website and is also published by EPD Hub & EPD International.

2.9. HEALTH PRODUCT DECLARATION (HPD)

Armourcoat P01+ does not contain any REACH materials that are listed as materials of very High Concern.

A full Health product declaration has been carried out for this product and is available here: <https://hpdrepository.hpd-collaborative.org/Pages/Results.aspx#k=armourcoat>

2.10. LIVING BUILDING CHALLENGE (LBC)

Living Building Challenge (LBC) Red List Approved is a status indicating that a product is in compliance with the requirements of the LBC Challenge. Armourcoat P01+ has met this challenge and contains no materials that appear on the LBC Red List - March 2022.

3. SUITABLE SUBSTRATES

Armourcoat P01+ plaster can be applied to any backing that is firm and true and will not crack. In our experience the best substrates to work onto are taped and jointed plasterboard and plastered walls that are fully dry.

Never attempt to apply over wallpaper or lining paper. Care should be taken on surfaces that are already decorated. Armourcoat P01+ plaster can be applied to existing painted surfaces provided the paint is well adhered to the wall.

A flat or true substrate is vital to achieve high quality results as any bumps or imperfections may show up in the finished surface.

Whilst P01+ plaster will bond to MDF great care should be taken when using it as a continuous substrate as it will tend to crack along any joint lines.

Full specification sheets for all types of substrates are available on request.

3.1. SUBSTRATE SPECIFICATION FOR PLASTERBOARD AND DRY LINING INSTALLATION

3.1.1. Introduction

This specification emphasises the importance of build quality and surface flatness. The purpose of this is to provide a quality of finish which will receive the long-term approval of the client and meet or exceed the expectations of the Architect and Project Managers.

The specification is for guidance only. It describes good working practice. It does not claim to be the right or only way of creating a satisfactory substrate and is made without responsibility for the execution of the work. Build quality is the responsibility of the installer/builder.

3.1.2. Construction

The wall shall be firmly constructed in metal stud partition which shall be vertically plumb and built to a true horizontal line without undulations, within strict tolerances:

- Plus, or minus 1mm in 600mm
- Plus, or minus 3mm in 1.8 metres

Timber supports may be specified in limited circumstances but to minimise the risk of cracking, the timber shall be seasoned to a moisture content not exceeding that recommended in BS5268 Part 2 1984. If in doubt in the seasoned quality of the timber, specify metal supports.

In the construction of the stud partition walls, ensure that the vertical and cross supports are in position to support board joints on all four edges to avoid fault lines and the risk of cracking.

Sticking plasterboard onto walls with dabs is not a fixing method recommended by Armourcoat as the results will vary depending on both the skill and diligence of the applicator, and it is much less predictable than mechanical fixing to studs.

The application of decorative plaster can involve the material being heavily trowelled as it is finished. The forces involved are often greater than normal plastering and will therefore only highlight any weaknesses in the substrate at the final stages.

3.1.3. Recommended Fixing Details for Plasterboard Walls

CONSTRUCTION	BOARD THICKNESS (MM)	LENGTH OF FIXING SCREWS (MM)		MAX FIXING CENTRE (MM)	MAX SUPPORT CENTRE (MM)
		1ST BOARD	2ND BOARD		
Timber Frame Support using Gyproc Drywall Screws	12.5	36	50	300	600
Metal Frame Supports 0.55mm to 0.7mm use Gyproc Drywall Screws 0.75mm to 2.5mm use Gyproc Jack-Point Screws	12.5	25	38	300	600
For curved or circular walls reduce support centres to 300mm					

3.1.4. Movement

The walls when boarded out shall have no discernible movement when subjected to intermittent pressures (rocking) or impact.

3.2. PLASTERBOARD FINISHING

The two methods of board finishing, prior to the application of Armourcoat products are taping and jointing and the application of a skim plaster.

3.2.1. Jointing Boards Prior to Taping

Only jointing compounds approved by the board manufacturers shall be used to fill board joints, joint depressions, screw heads and any hammer or other impact marks. This operation shall be done in two applications; the first being allowed to set before the second is applied. Screw spotting shall be carried out between operations in the main jointing sequence. When filler is dry, sand down to remove snags and any unevenness. With square edge boards cracking risks will be reduced by filling open joints (2-3mm) full depth with jointing compound.

3.2.2. Taping and Jointing

Approved jointing tapes only shall be used. Armourcoat Limited recommends Gyproc joint tape applied in accordance with the manufacturer's recommendations. Ensure a clean surface free from dust or grease. Unroll tape centrally over filled joint pressing down firmly to ensure good adhesion. Apply a thin band of jointing compound 200mm wide over and beyond each side of the tape and trowel flat. Make sure the tape is firmly embedded with no air pockets. Using a jointing sponge, moisten the sponge and feather out the margins. Rinse sponge frequently to keep clean and soft. Obvious depressions in the surface can be filled again to correct surface flatness to the specified tolerances. When the sanding and filling process is complete and when the jointing compound is set and dry, lightly sand down the surface before applying a final layer of jointing compound 400-450mm wide feathered out either side of the tape avoiding any build over the tape run. Moisten the jointing sponge and feather out the edges.

NOTE: *This dubbing out procedure, in successive thin coats, is required to take out the bump caused by taping the board joint. All other unevenness in the background shall be taken out in a similar way or by plastering overall with Thistle Multi-finish if flatness cannot be achieved by any other means.*

Jointing compounds, particularly along wallboard joints, shall be thoroughly dry before sealing. When wallboard surfaces are sealed before the jointing compounds are dry, polished plaster applications cannot proceed since the joint lines will grin through permanently disfiguring the finished work.

3.2.3. Internal Corners

Armourcoat recommends Gyproc, Knauf and Lafarge joint tapes. The gap 2-3mm between corner boards shall be filled full depth with jointing compound. A thin layer of jointing compound is then applied to both sides of the arris. The joint tape is folded and pressed into the angle using a taping knife to bed the tape. Make sure that air bubbles are eliminated. There must be sufficient jointing compound left under the tape to ensure good adhesion. A thin layer of jointing compound 100mm wide shall then be applied to each side of the arris. When this coat has set, another coat of jointing compound 300mm wide shall be applied to both sides of the angle and the edges feathered out with a wetted sponge float or a damp sponge.

3.2.4. Obtuse Angles

Armourcoat recommends Gyproc, Knauf and Lafarge corner-tape for obtuse angles. It is often difficult to produce a sharp straight line when forming an obtuse angle. By using corner tape (zinc coated steel strips set on fibre paper) a good line can be formed where the directional change occurs. The procedure and sequence for fixing the tape and for finishing the surface of the plasterboard after fixing the tape is the same as in 6.1.2 but in this case feather out the plaster 600mm either side of the arris.

3.2.5. External Angles

With Armourcoat Polished Plaster applications a choice of angle protection is available.

- i. Gyproc Angle Bead
- ii. QIC Corner bead
- iii. SAS 90 Degrees High Strength Corners

Gyproc angle bead and QIC angle bead affords optimum protection where a sharp external arris is specified but note comments regarding high-risk locations. Cut to the required length. Place the angle bead plumb over the external corner guarding against flaring top and bottom. Fix angle bead in approved manner. Apply a 200mm wide 2mm thick band of jointing compound to both sides and feather out the edges with a wetted sponge float or sponge. When set and dried, apply a second layer of jointing compound 400-450mm wide to both sides of the angle and feather out the edges.

3.2.6. Feature Beads

Thin coat plastering beads are available from British Gypsum Ltd (Tel 0800 225225), SAS – (Tel 0118 9290900) or QIC Trims (Tel: 01280 818 950). For detailing drawings please refer to the end of this document.

3.2.7. Sealing Surface

All prepared wall surfaces shall be painted with an approved wallboard primer. Gyproc Topcoat and Knauf wallboard primer are approved by Armourcoat Limited. Before wallboard sealers are applied, the jointing compound must be thoroughly dry. Where wallboard surfaces are sealed before the jointing compounds are dry, polished plaster applications will be disfigured since dampness underneath the sealer will cause permanent shadow lines as the wall dries out. Similarly, shadow lines will arise at joint lines if surfaces are not sealed first.

3.3. PLASTERING

3.3.1. Skim Coat

An approved gypsum skim coat plaster such as Gyproc Multifinish shall be used on two 12.5mm layers of plasterboard on straight walls and shall be fixed vertically and supported on all four edges. When used for curved walls with a radius of 2.5 metres or greater, the plasterboard shall be used in two layers fixed horizontally and supported on all four edges. Each layer of board shall be independently fixed in accordance with the fixing details in table on page 1. The second layer of plasterboard shall be constructed with open joints 2-3mm apart. The joints in the two layers shall be staggered to prevent fault lines that could induce cracking. The finished boarding shall be finished flat with no discernible undulations, bumps, hollows or dives and within tolerances of plus or minus 1mm in 600mm and plus or minus 3mm in 1.8 metres.

PLASTER GRADE	RECOMMENDED THICKNESS (MM)	JOINT REINFORCEMENT
Thistle Multi-Finish	2-3	Gyproc Joint Tape
Thistle Board Finish	2-3	Gyproc Joint Tape

All plasters shall be used in accordance with the recommendations of BS5492 Code of Practice for Internal Plastering.

3.3.2. Taping & Jointing

In setting the plasterboard a gap of 2-3mm shall be left between adjoining boards which shall be filled full depth before taping the joints. Only approved proprietary jointing tapes shall be used in accordance with the manufacturer's recommendations.

Tapered edge boards are recommended, and the joints should be reinforced with Gyproc joint tape or similar and filled flush with the surface of the board. No discernible bump or hollow should be present at the joints once the surface has been sanded.

Where low profile drywall beads have been fixed at the perimeter, they should be feathered out by at least 350-400mm to ensure no obvious flaring at the edges.

3.3.3. External Angles

Corner beads for plaster shall be used to provide protection to the external corners.
In locations where corner damage may occur, insert wood or metal end capping.

3.3.4. Internal Angles

All internal angles shall be reinforced with mesh or taped in accordance with the board manufacturer's specification.

3.3.5. Priming

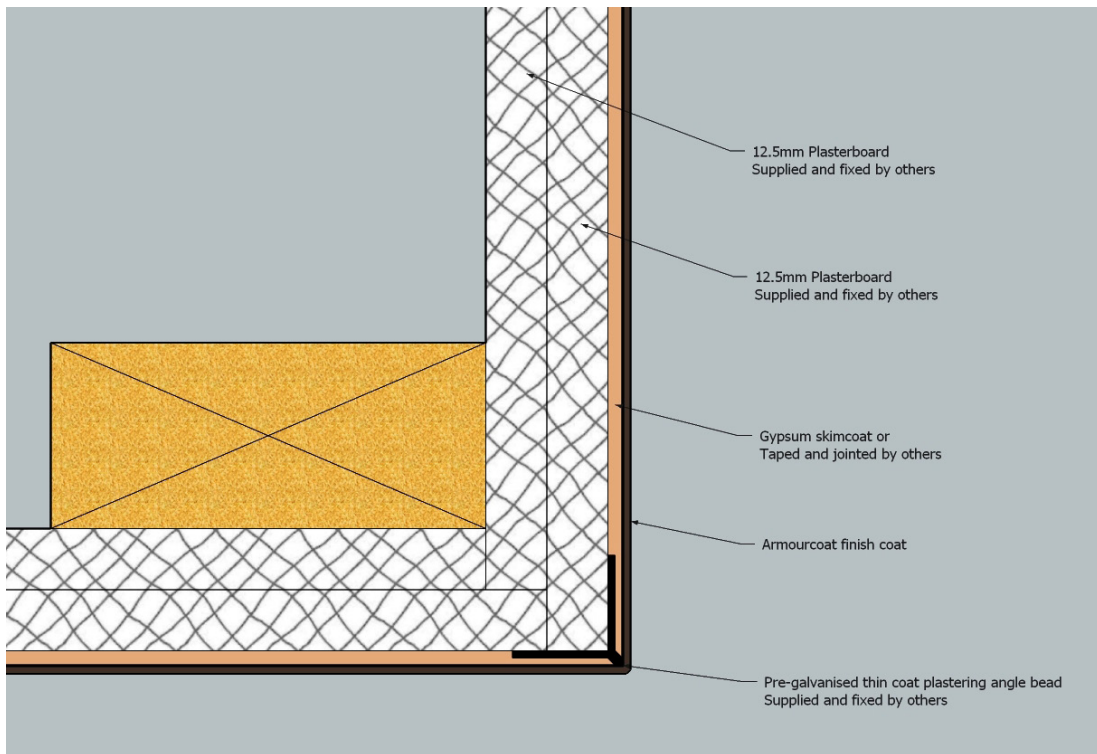
Plaster must be allowed to dry fully and then be primed with a mist coat of matt paint of an suitable wallboard primer.

Sealing before surface is dry will cause de-lamination or disfiguration of finish.

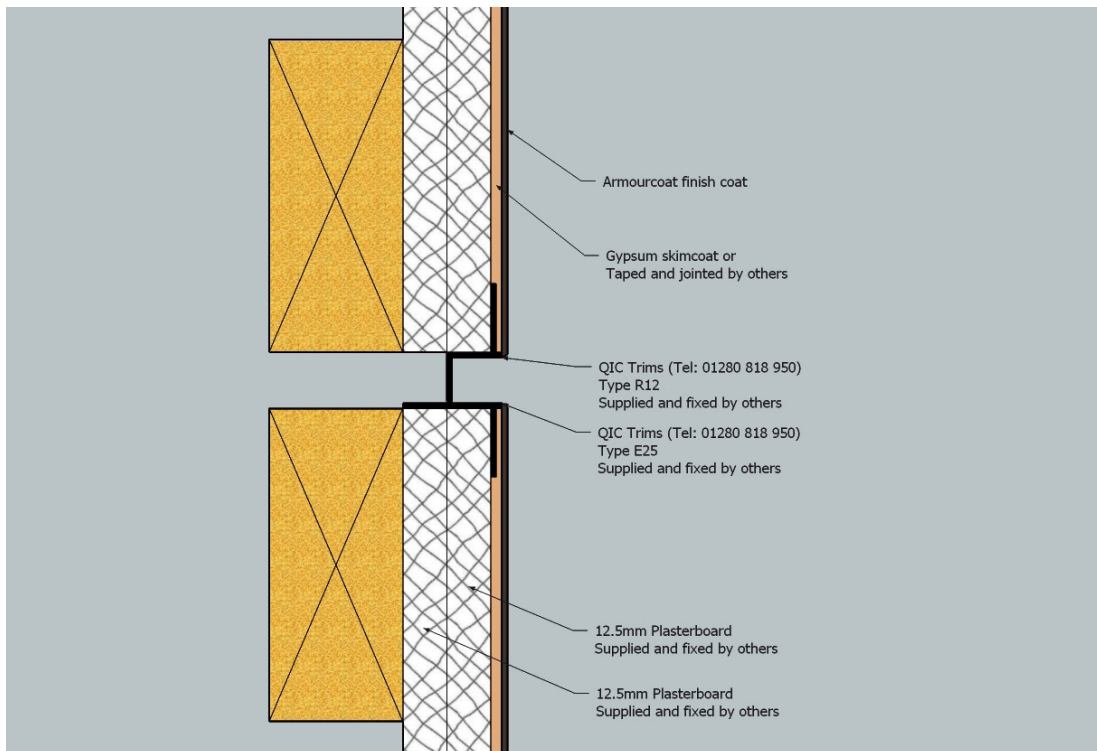
3.4. DIAGRAMS

The specification is for guidance only. It describes good working practice. It does not claim to be the right or only method to provide a solid substrate and is made without responsibility for the execution of the work. Build quality is the responsibility of the installer/builder.

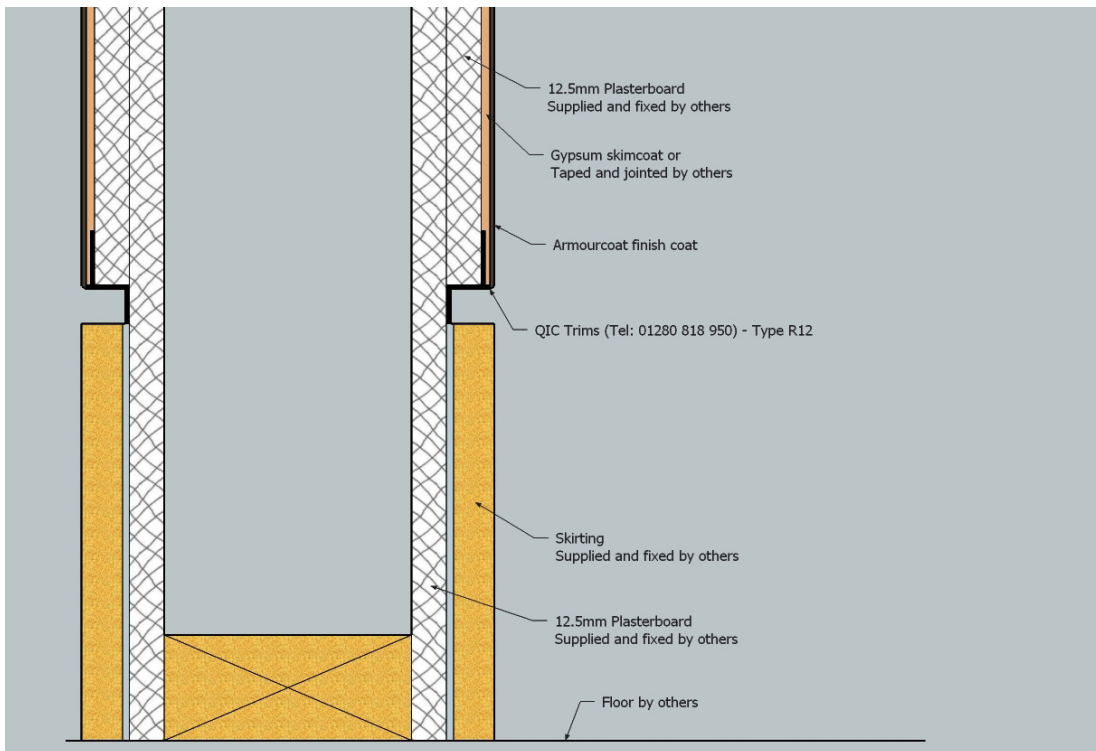
3.4.1. 90 degree corner detail for skimmed / taped & jointed plasterboard substrates



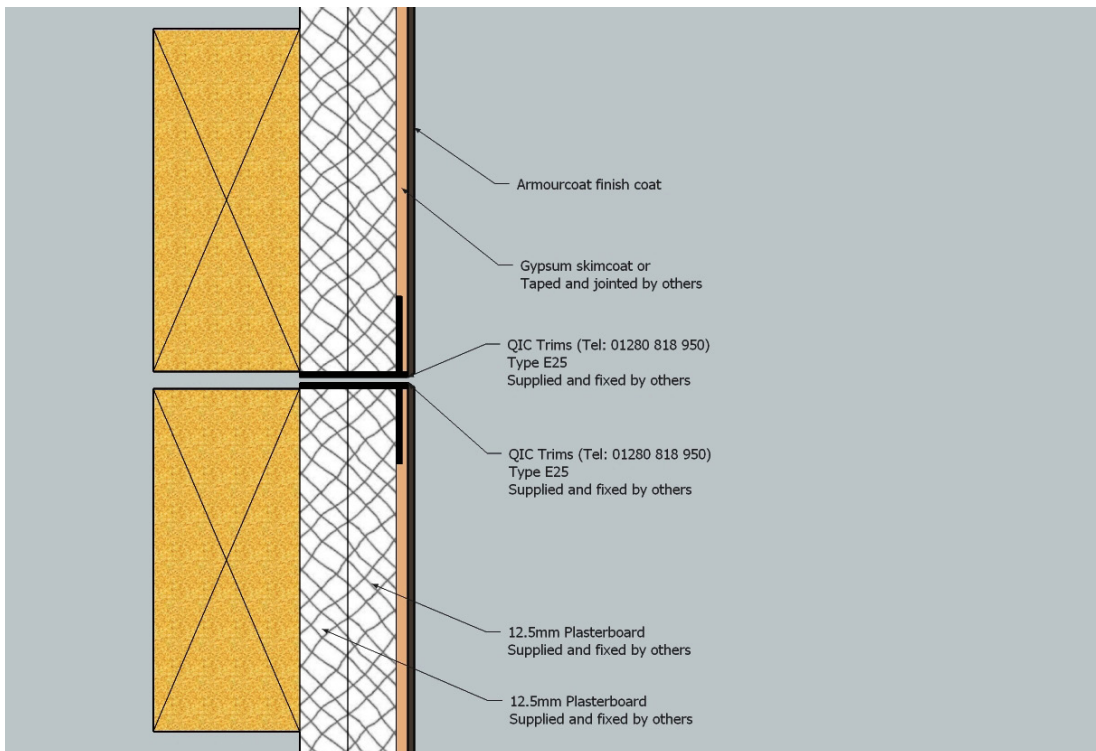
3.4.2. Shadow gap detail for skimmed / taped & jointed plasterboard substrates



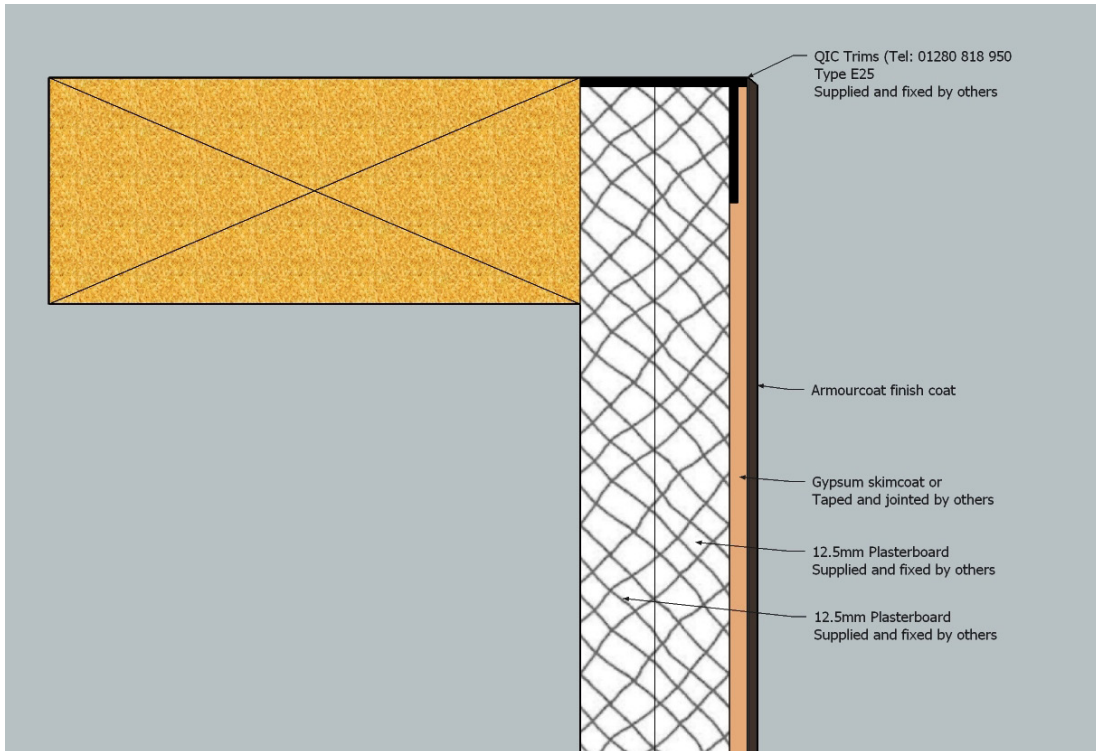
3.4.3. Skirting detail for skimmed / taped & jointed plasterboard substrates



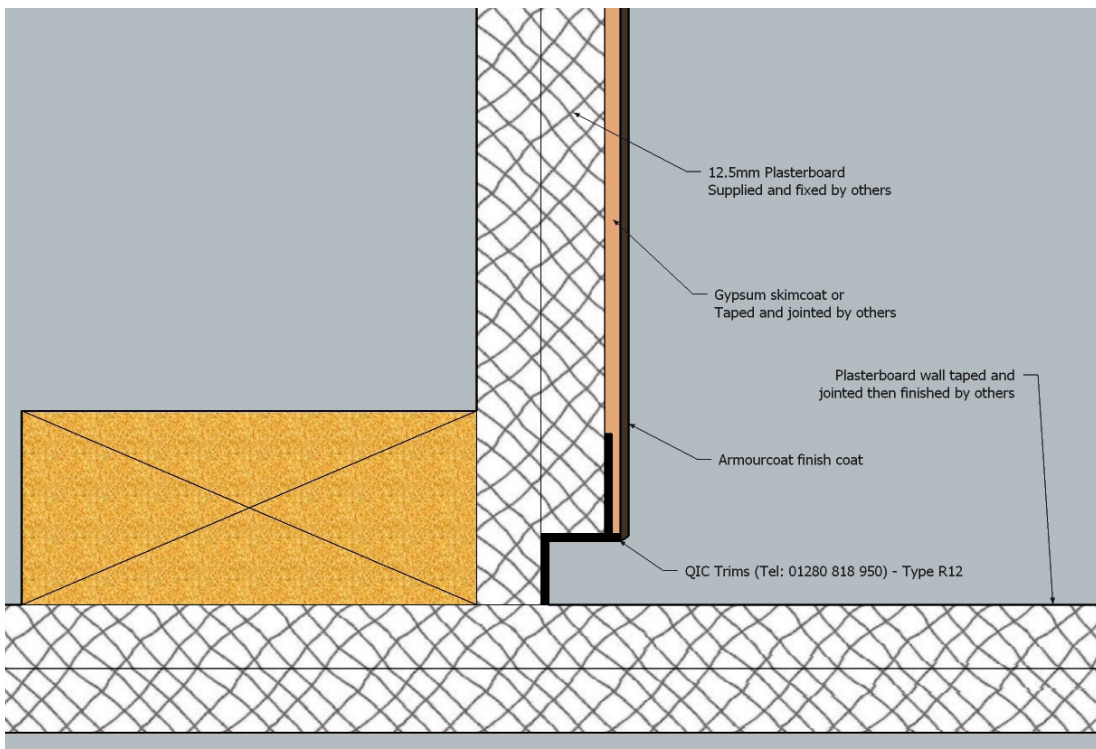
3.4.4. Expansion joint detail for skimmed / taped & jointed plasterboard substrates



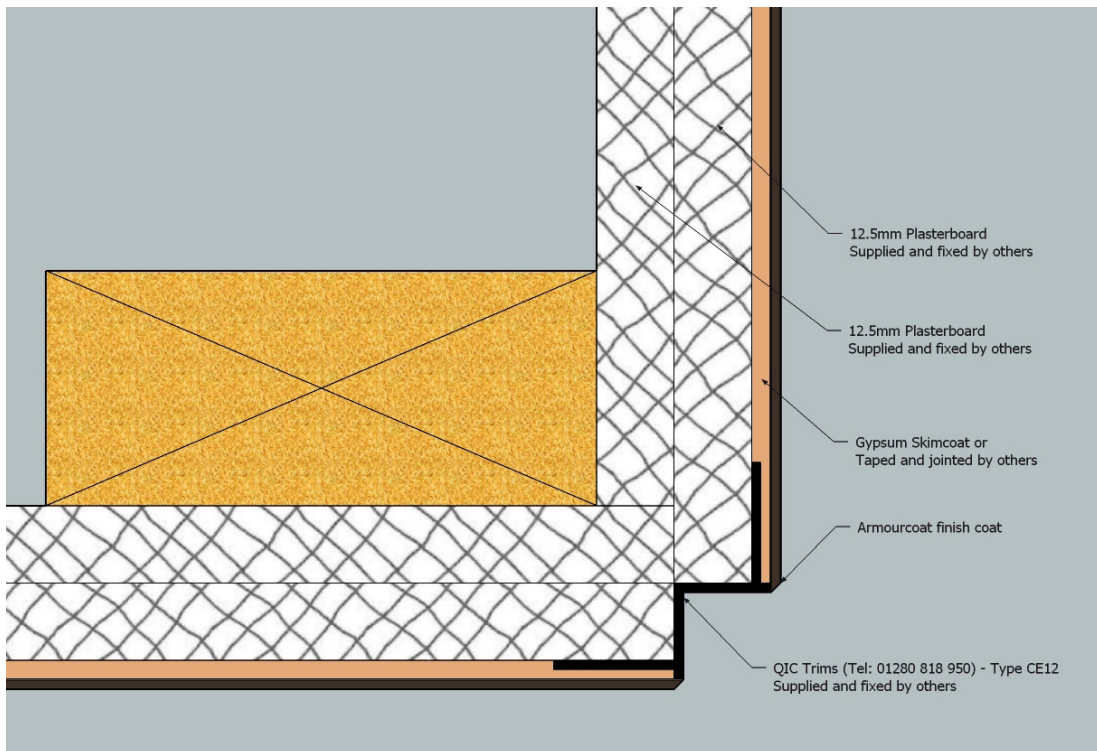
3.4.5. Reveal trim detail for skimmed / taped & jointed plasterboard substrates



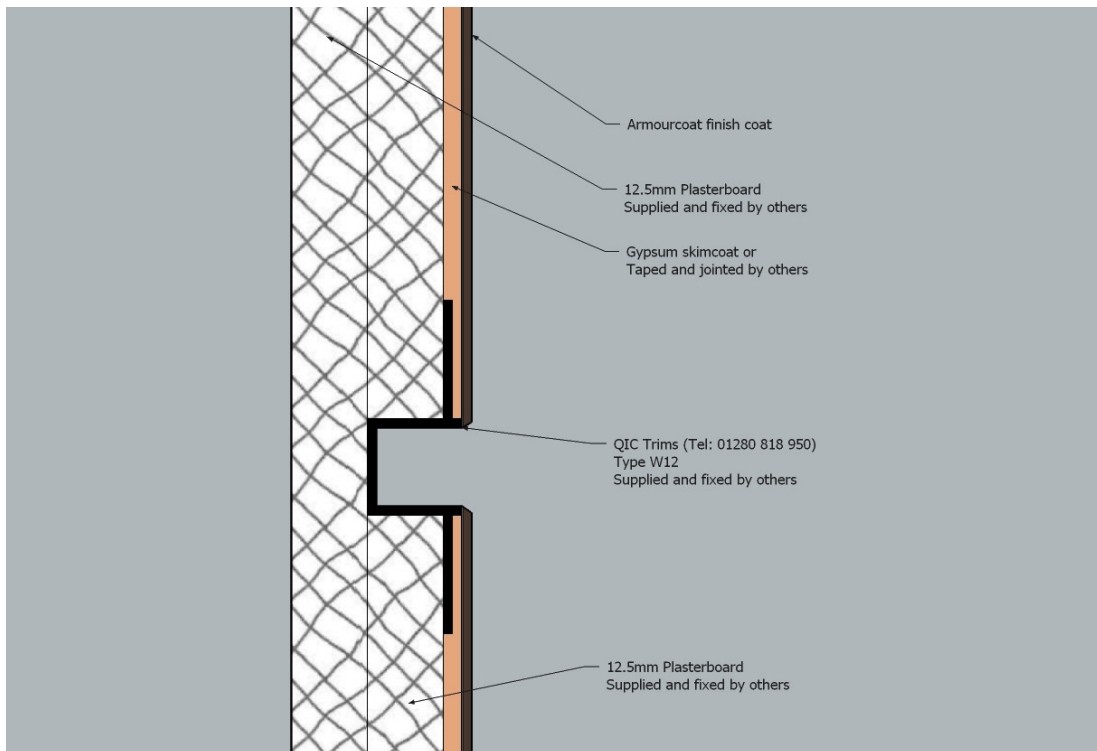
3.4.6. Shadow gap detail at internal corner for skimmed / taped & jointed plasterboard substrates



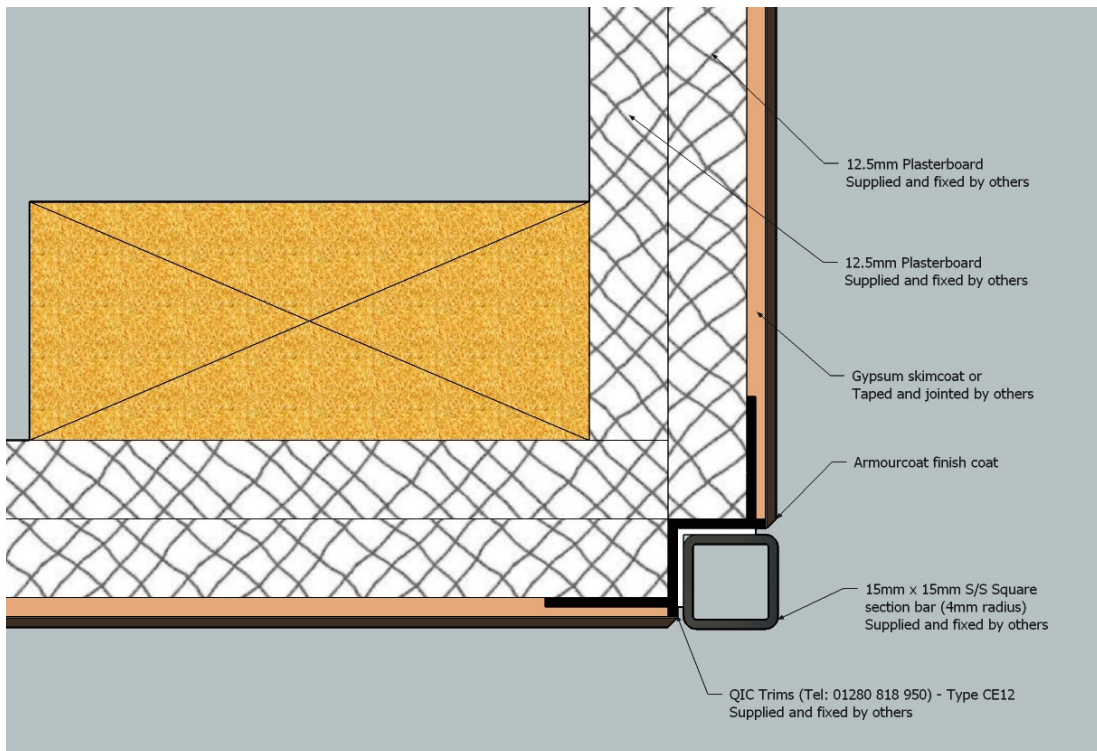
3.4.7. Inverted corner detail for skimmed / taped & jointed plasterboard substrates



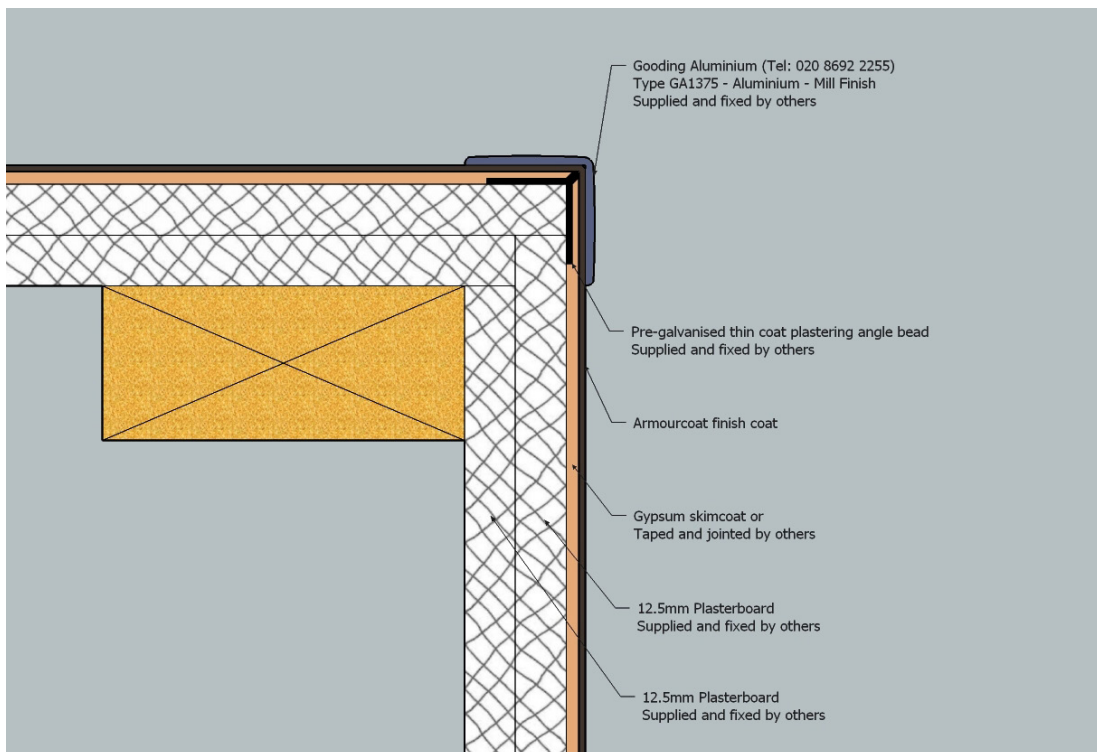
3.4.8. Top hat bead detail for skimmed / taped & jointed plasterboard substrates



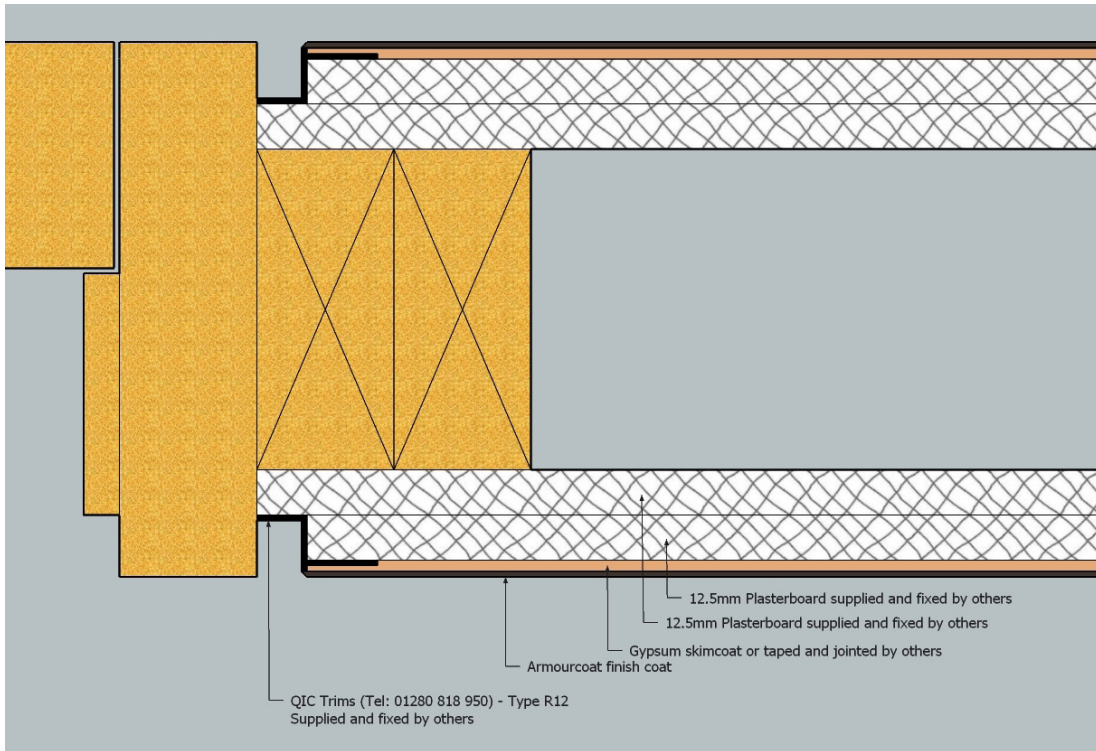
3.4.9. Reinforced metal corner detail for skimmed / taped & jointed plasterboard substrates



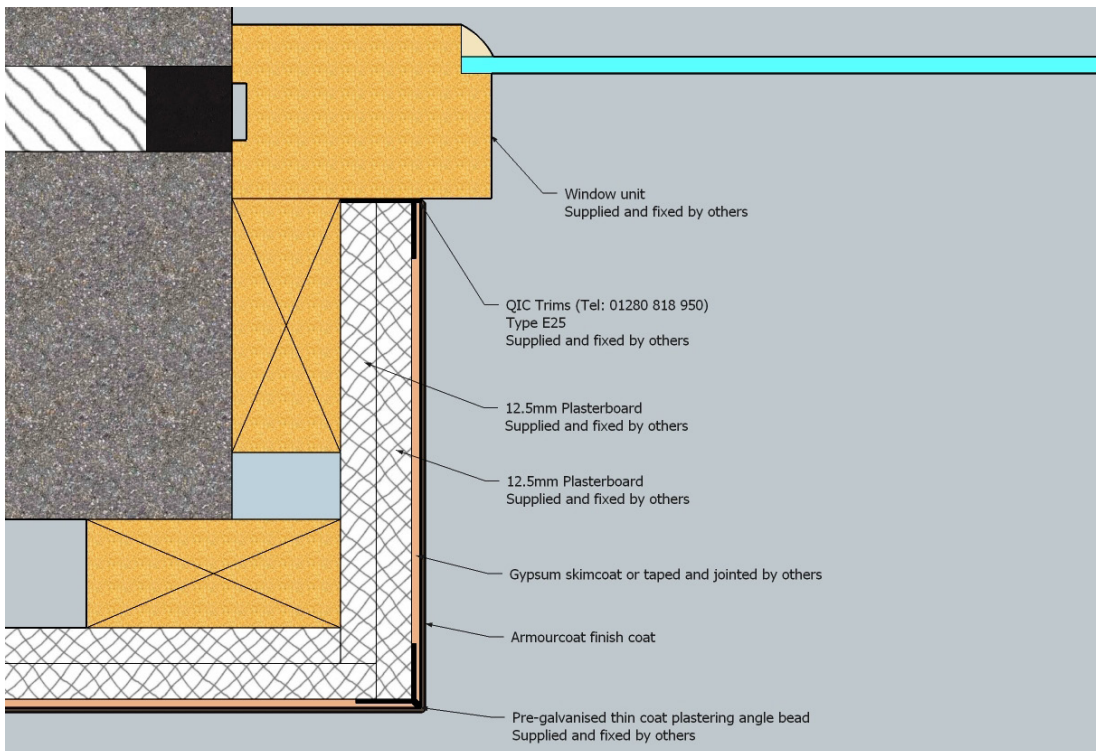
3.4.10. 90 degree corner detail with protective angle for skimmed / taped & jointed plasterboard substrates



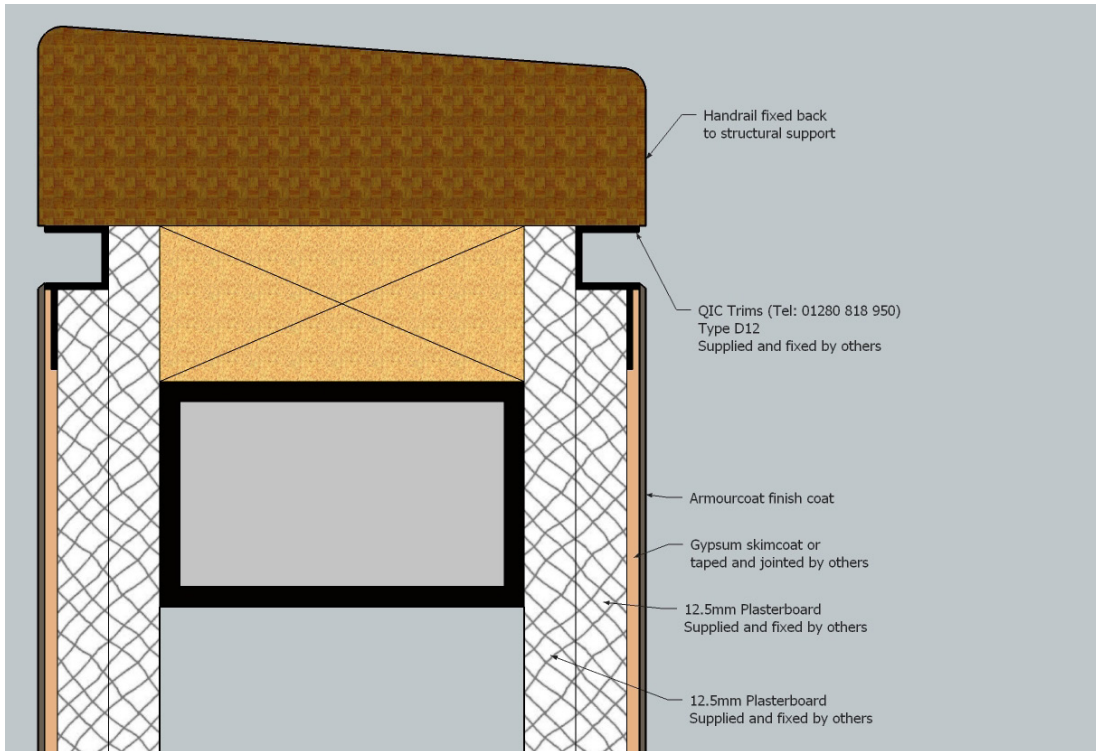
3.4.11. Shadow gap door junction detail for skimmed / taped & jointed plasterboard substrates



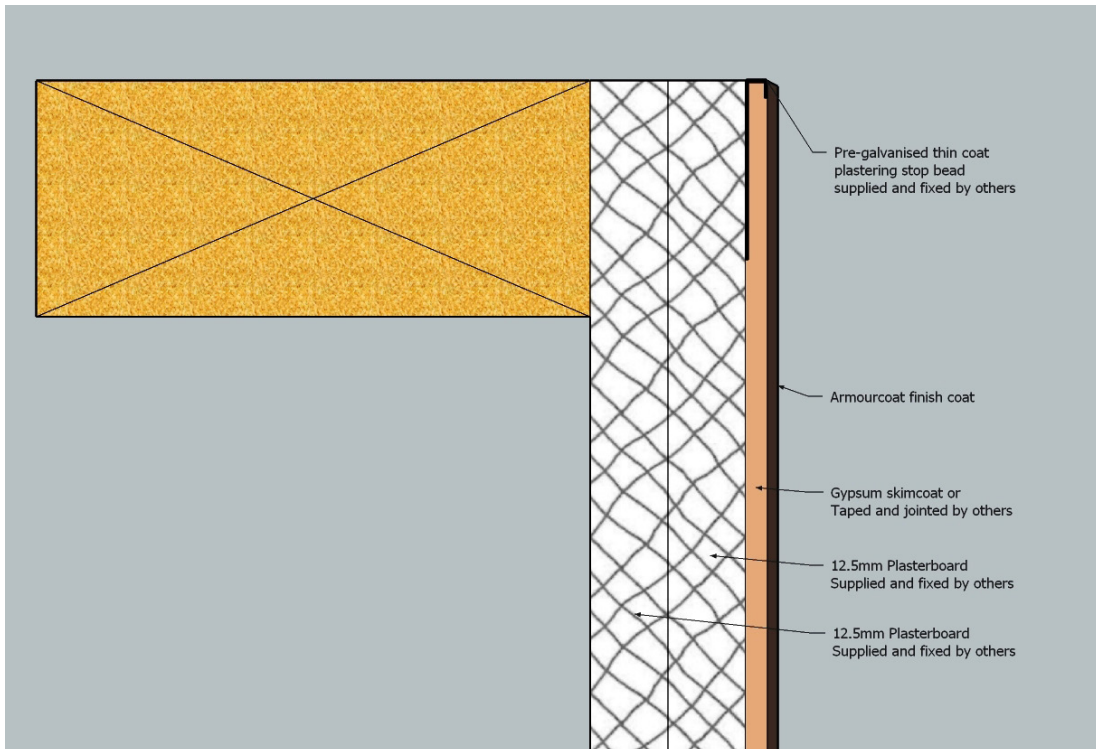
3.4.12. Window reveal detail for skimmed / taped & jointed plasterboard substrates



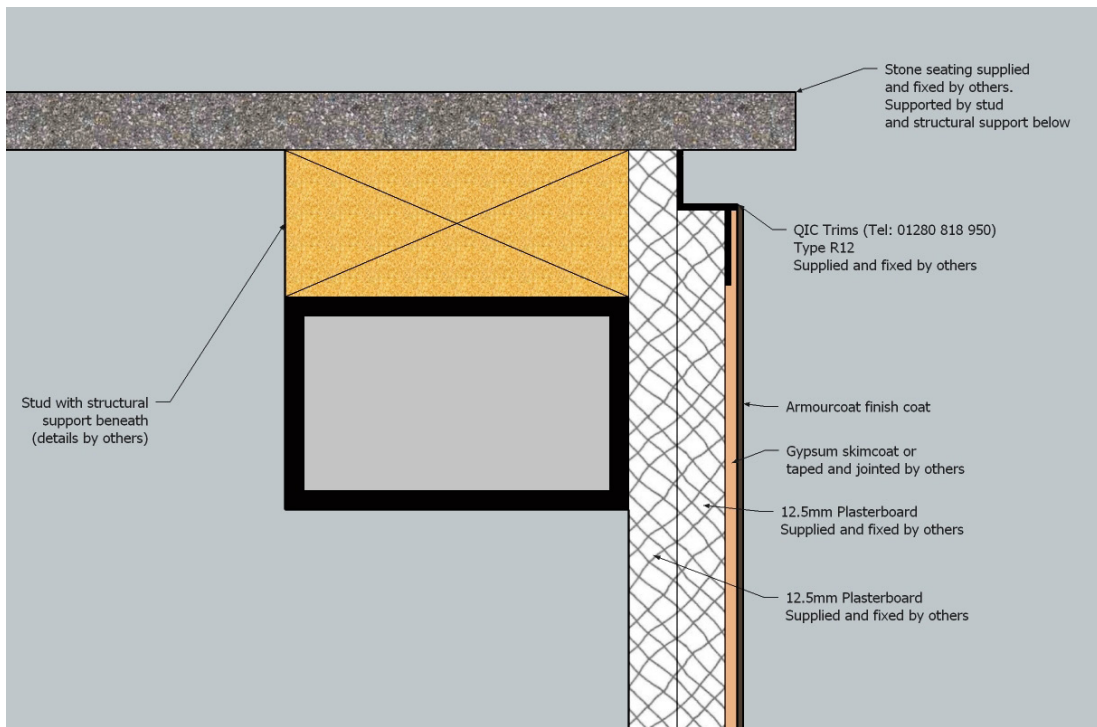
3.4.13. Balustrade top detail for skimmed / taped & jointed plasterboard substrates



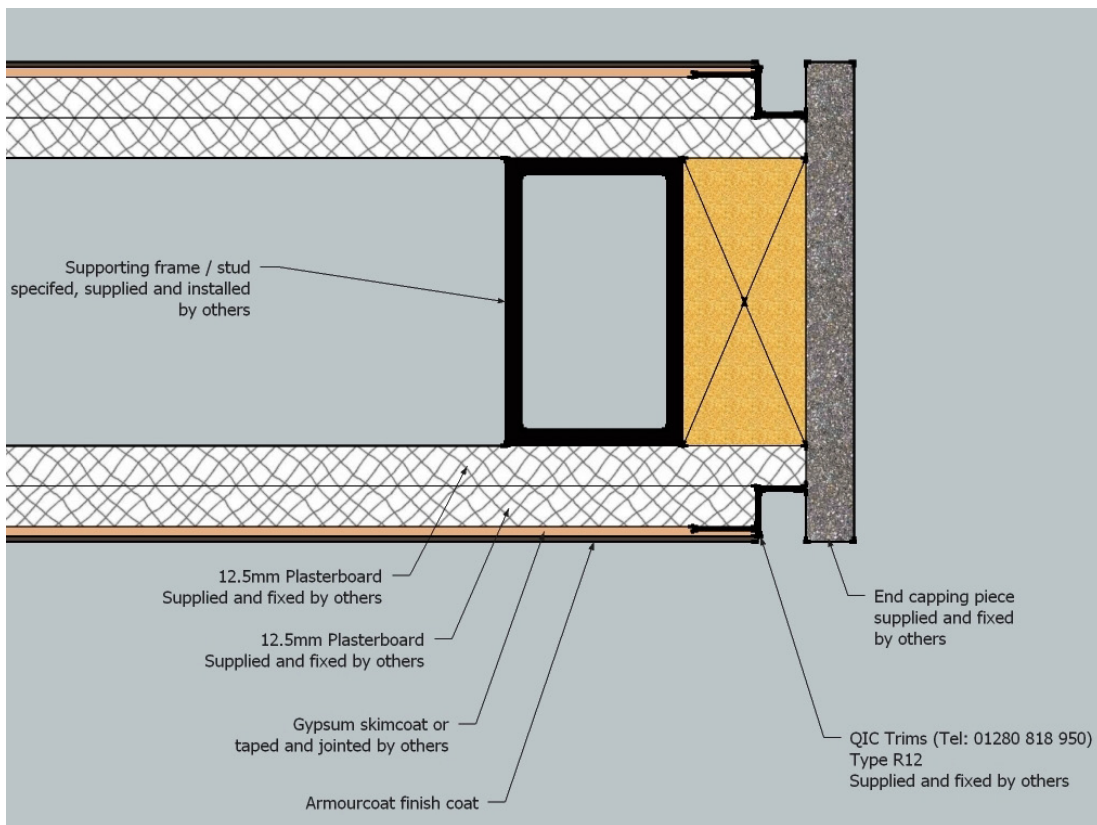
3.4.14. Stop bead detail for skimmed / taped & jointed plasterboard substrates



3.4.15. Stone seat detail for skimmed / taped & jointed plasterboard substrates



3.4.16. Protective wall end cap detail for skimmed / taped & jointed plasterboard substrates



4. CARE AND MAINTENANCE

4.1. CLEANING SURFACE DIRT AND GRIME

The quickest and simplest way of removing small areas of surface grime and finger marks is to rub the affected area with a pencil eraser. The eraser will remove all but the most stubborn surface marks without affecting the surface of the plaster in any way.

Larger areas may need to be cleaned with Armourcoat soap sealer diluted with water.

Clean the surface with a 1:5 mixture Soap sealer and water using a microfibre mop and towels to dry the surface.

Under no circumstances use acid-based cleaners for this process as they will cause permanent damage to the walls.

Once the surface is clean and dry apply Armourcoat Ecowax/Aquawax and buff the surface with a clean cloth.

4.2. CLEANING SCUFF MARKS

If the surface of the plaster has been scuffed with a shoe or plastic item and cannot be removed with a pencil rubber, try the following method:

Take some masking tape and press it firmly onto the affected area and then pull directly off. Repeat this process 2 or 3 times or until the mark has been removed.

4.3. STUBBORN MARKS

If you are unable to remove any mark using a pencil rubber or masking tape it may be necessary to lightly sand the surface in the affected area.

Sand the surface lightly with 600 grit sandpaper followed by 1000 grit to bring back the polish. Do not sand heavily in a small area as this may cause a dip.

Avoid sanding too far into the surface as this will expose a greater amount of marble grain and affect the pattern.

Re-apply wax polish and buff up the surface.

4.4. REPAIRS

Armourcoat P01+ can be repaired if the surface is impacted, or the corner gets chipped. This is best done by a craftsperson skilled in the application of the material.

Small repairs will not be obvious but larger repairs or patches will be noticeable and may necessitate a reapplication to the surface from corner to corner.

4.5. GENERAL MAINTENANCE

There are two primary ways to keep Polished Plaster finishes looking and functioning great – wiping them down whenever you notice any surface grime and then refreshing their protection coats every few years.

Armourcoat recommends that every 3-5 years wax and sealer coats are reapplied to enhance both the finishes protection and aesthetics - thus extending the products life cycle.

5. WARRANTY

10-year materials warranty for interior use.

B. POLISHED PLASTER SELECTOR RANGE -SMOOTH EXTERNAL

1. PRODUCT DESCRIPTION

Smooth is a mid-sheen finish with visible marble grain and subtle tonal variation across the surface. The Smooth polished finish is like traditional Marmorino, which was used extensively in northern Italy during the Renaissance period and beyond as an internal and external wall finish and as a background for the ornate frescoes which dominated much of the decoration of that time.

Armourcoat Smooth External is created using our lime and marble PPX mix.

This is used in combination with our PPX basecoat which is used to level the surface and provide a flat stable base for the topcoat.

We will generally incorporate a reinforcing mesh into the basecoat to reduce the risk of movement cracks.

Armourcoat PPX is a natural hydraulic lime finish which has been enhanced with hydrophobic polymer technology. The two-layer topcoat finish incorporates crushed marble, hydraulic lime and cement to achieve stunning surface finishes. It can be applied as part of the Armourcoat PPX external wall insulation system (EWI) or over Brick, Blockwork, Concrete and Cement board.

The Armourcoat PPX EWI System provides a layer of insulation using mineral wool boards.

These are suitable for new builds and renovation projects producing stunning decorative stone like surface finishes using Armourcoat PPX Topcoat.

The Armourcoat PPX Systems offer a durable weatherproof coating for building exteriors or areas prone to moisture.

Properties

- A polymer-modified limestone external render suitable for new build and renovation projects
- Offers a durable weatherproof vapour permeable decorative layer
- Available in a stunning range of light natural stone colours and finishes
- Armourcoat PPX topcoat contains 25% recycled material
- Armourcoat PPX EWI System added layer of insulation
- Suitable for most substrates including brickwork, blockwork, masonry or stone backgrounds, cement board, EPS foam insulation board and Mineral Wool
- Part of ETAG approved EWI (External Wall Insulation) system to offer outstanding thermal insulation and fire safety to the exterior of the building
- EWI system increases energy efficiency and reduces building maintenance
- EWI system tested to ETAG-004 by Lucideon - independent material testing
- Achieves A2-s1, d0 fire classification as outlined in EN13501
- LBC Red List Compliant

1.1. EXPECTATIONS AND LIMITATIONS

Lime based plasters have been used in exterior situations for many centuries. The products themselves are more suitable for use in Mediterranean type climates but have been used with success in many climates across the world.

Armourcoat Polished plasters are natural mineral materials and will age naturally. If your requirement is for a surface with monotone and uniform colour that will not change over time, then you should use a synthetic polymer finish. If, however you seek the soft tonal variations and natural mineral quality of walls such as those seen in Venice and Rome, and you can accept and appreciate the charm of walls that reflect the age of the building, then Armourcoat Polished Plaster is a suitable product.

The durability and longevity of these exterior plasters depends on many factors including environment, building details, the level of exposure and the standard of workmanship.

Careful attention needs to be paid to the building design and details in line with these guiding principals:

- Only apply to vertical surfaces
- Only finish down to the damp course and never to the ground
- Only use in light colours
- Ensure there is a suitable protective overhang at the top of the wall
- Avoid situations where water will constantly run down the face of the plaster

1.2. SURFACES

Only apply to vertical surfaces. These products are in no way suitable for finishing horizontal or inclined surfaces as they will not shed water adequately.

1.3. COLOUR

The only pigments that are suitable in an exterior situation are Iron Oxide pigments which are inert and totally resistant to ultraviolet light.

Darker colours absorb thermal energy from the sun more quickly which causes the walls to heat up and expand. constant rapid thermal expansion and contraction may eventually lead to micro or road map cracking in the surface.

All lime plasters can be prone to efflorescence which can disfigure the appearance of a wall and this is more likely to occur and more noticeable on darker colours.

We therefore have an upper limit of pigment addition of about 1%.

1.4. OVERHANGS AND SOFFITS

It is important that the roof has an overhang, which protects the walls from straight falling rain. In very wet climates elements such as sills and eaves should project well beyond the face of the wall and be provided with ample drip grooves to ensure that water is thrown clear of the wall face.

Semi-external & protected areas such as under soffits will age differently to directly exposed areas and streaking will occur if water is allowed to run down localised areas of the surface. If water permeates through from behind the plaster, it can lead to darkening and staining of the finish.

If maintenance is to be kept to a minimum it is essential that adequate drainage from all gutters, down pipes and waste pipes is available to ensure that there is no accumulation of water on or adjacent to the building.

2. TEST DATA

Polished Plaster has been subjected to a range of Fire and Exterior performance testing.

2.1. EUROPEAN FIRE TEST RESULTS

Independent tests were carried out in the UK for classification of reaction to fire performance in accordance with EN13501-1:2018.

REACTION TO FIRE CLASSIFICATION
A2 - s1, d0*

*Both Armourcoat PPX and Armourcoat PPX EWI

2.2. HYGROTHERMAL TESTING

Hygrothermal testing was done in accordance with the method given in ETAG 004:2013 Guideline for Technical Approval of External Thermal Insulation Composite Systems with Rendering.

System tested with Rockwool External Wall DD Slab (100mm) with Armourcoat PPX Basecoat, Armourcoat PPX Topcoat and Sealer 56.

TEST	ETAG 004 CLAUSE	REQUIREMENT	PASS/FAIL
Hygrothermal Performance - Wall	5.1.3.2.1	No cracking, blistering, peeling or delamination	Pass
Bond Strength - Wall	5.1.4.1.1	≥ 0.08 N/mm ² or cohesive failure of insulation	Pass
Hard Body Impact Resistance - Wall	5.1.3.3; ISO 7892:1998	Category I, II or III	Category II
Bond Strength Control - Small Samples	5.1.4.1.1	≥ 0.08 N/mm ² or cohesive failure of insulation	Pass
Capillary Test - Small Samples Basecoat only	5.1.3.1	< 0.5 Kg/m ² after 24 Hours	Pass
Capillary Test - Small Samples Full system including Sealer 56	5.1.3.1	< 0.5 Kg/m ² after 24 Hours	Pass

System Two tested Armourcoat PPX Basecoat, Armourcoat PPX Topcoat and Matt Sealer 56.

TEST	ETAG 004 CLAUSE	REQUIREMENT	PASS/FAIL
Hygrothermal Performance - Wall	5.1.3.2.1	No cracking, blistering, peeling or delamination	Pass
Bond Strength - Wall	5.1.4.1.1	≥ 0.08 N/mm ² or cohesive failure of Insulation	Pass
Hard Body Impact Resistance - Wall	5.1.3.3; ISO	Category I, II or III	Category II

2.3. LIVING BUILDING CHALLENGE (LBC)

Living Building Challenge (LBC) Red List Approved is a status indicating that a product is in compliance with the requirements of the LBC Challenge. Armourcoat PPX has met this challenge and contains no materials that appear on the LBC Red List - March 2022.

3. SUITABLE SUBSTRATES

The specification is for guidance only. It describes good working practice. It does not claim to be the right or only method of using render board to provide a solid substrate and is made without responsibility for the execution of the work. Build quality is the responsibility of the installer/builder.

Armourcoat recommend the use of either Siniat Bluclad cement fibre board, Fermacell H2O Power Panel Board or Euroform Rendaboard. If other makes or types of render board are to be used, please contact Armourcoat first.

Architects, when specifying Polished Plaster, shall give special attention in their design to wall line or flatness, avoidance of cracks and external corners. Recommendations on these matters are contained in this specification.

This substrate is to be used in situations where Armourcoat PPX is likely to be splashed intermittently with water or exposed to external weathering but not fully submerged.

The following construction relates to non-loadbearing constructions up to 4 m in height. For additional heights in excess of 4 m please contact the board manufacturer (see suppliers list - section 3.7.4).

3.1. BRICK, BLOCK AND CONCRETE

For substrates such as masonry, dense concrete blocks, lightweight aerated concrete blocks, in situ concrete and thin joint autoclave block systems, PPX Basecoat can be applied to a minimum of 6mm and a maximum of 12mm thickness in preparation for the application of PPX Topcoat. If tolerances exceed +/- 3mm in a horizontal, vertical or diagonal plane a scratch coat of Armourcoat PPX should be used.

3.2. CEMENT BOARD

The Armourcoat PPX system can be applied directly onto cement board.

Install the cement board with suitable fixings in line with the manufacturer's recommendations.

When working around windows or door openings, it important not to join two boards at the corner as this is a natural stress point. Cut the corner section out of a single board and fix this around the opening.

Some systems include the application of a mesh at the joints prior to the application of the mesh render system. We consider this to be good practice for avoidance of hairline cracks at panel joins and so for systems that do not have this requirement as part of their installation procedure we do recommend the application of a secondary mesh over the joints that is 150mm in width or the application of a second layer of boards with staggered joints.

3.3. EWI SUBSTRATES

Armourcoat PPX can also be applied over mineral wool board and when specified this makes up part of the Armourcoat PPX system.

The application of Armourcoat K40 Primer is recommended onto most substrates to even out the suction between the brick or blocks and the mortar joints or on high suction backgrounds to reduce the absorbency of the substrate.

3.3.1. System Components

The Armourcoat PPX EWI System provides outstanding thermal insulation tested to stringent ETAG (European Technical Approval Guidelines) standards.

Insulation layer - The Armourcoat PPX EWI System uses Rockwool External Wall DD Slab board. The board is fixed by adhesive (Armourcoat PPX Basecoat) or mechanical fixings (Armourcoat CN8 fixings) or a combination of both.

Mesh layer - Armourcoat's premium alkali resistant mesh cloth is incorporated into the basecoat. This provides both reinforcement, impact and crack resistance together with improved tensile strength.

Base layer - Armourcoat PPX Basecoat render is then applied at a thickness of 6-8mm with a maximum thickness of 10-12mm in one coat. The high-performance material provides the perfect base for Armourcoat PPX topcoat and creates a high performance durable coating.

Top layer - Armourcoat PPX Topcoat creates the distinctive Armourcoat honed and textured stone like finish.

Protective sealer layer - We have two main options for a protective layer to the surface.

Armourcoat Sealer 56 is used to provide enhanced protection from staining together with UV, abrasion and water resistance.

Armoursil impregnator reduced the water uptake and absorbency of the finish without reducing the water vapour permeability.

3.3.2. EWI Refurbishment of Existing Buildings

EWI systems are the preferred choice providing a cost-effective method of renovation of traditional buildings requiring thermal performance improvements. There are an estimated 7 million buildings in the UK built from single skin solid walls and a smaller number of non-traditional construction methods including precast concrete and steel frames. In these buildings the structural wall is cold and damp with an increased risk of mould and condensation. Even in buildings designed with cavity wall insulation the unprotected outer leaf construction is at risk of cold bridging and weather damage. Most existing buildings do not meet the standards set by modern Building Regulations with increasing costs of heating and maintenance a central issue for both commercial redevelopment and domestic refurbishment.

Architects and designers can transform the external façade of existing building through the specification of Armourcoat PPX and in combination with the Armourcoat PPX EWI System to upgrade thermal performance, fire safety and appearance. The wide range of colours and finishes based on Armourcoat's highly regarded polished plaster surfaces can create original and highly aesthetic façades including application of banding and stencil techniques.

The Armourcoat PPX EWI System provides instant savings in energy costs through improved thermal performance whilst protecting and enhancing the appearance of the exterior of the building.

3.3.3. EWI New Build and Substrate Systems for New Builds

EWI systems provide the specifier with modern design options to create original and innovative building façades for new build projects. Meeting and often exceeding Building Regulation requirements for thermal performance, EWI systems even achieve standards for demanding projects including sustainable low energy buildings such as Passivehouse designs.

Suitable for all types of substrates including brick, block, masonry, timber or lightweight metal frame the PPX EWI system works to compliment or contrast with other building materials including stone, glass and timber. The Armourcoat PPX topcoat can create stunning stone like finishes in a wide range of colour and finishes which can incorporate detail elements such as branding, logos and stencil designs.

Steel frame construction

An external skin of cement particle board (CPB) is applied to the steel framework to provide insulation within the frame and external face. This enables a fast-track panellised system for rapid construction.

Timber frame construction

An external skin of oriented strand board (OSB) or sterling board is applied to the timber framework. Detailing will include emphasis on possible increased structural movement.

Masonry construction

A traditional method where the internal load bearing wall (including concrete blocks, aerated blocks, thin joint systems and single skin brick construction) with stainless steel ties to an outer wall of either brick or block.

SIPS (structural insulated panel systems) construction

An alternative to traditional construction methods SIPS incorporates high performance insulation with CPB/OSB fixed to both sides.

Modular construction

Another modern method using pre-finished 'Volumetric' pods typically complete with external finishes and services ready for onsite assembly.

ICF (insulating concrete form) construction

EPS formwork system with concrete core offering enhanced thermal and acoustic properties along with design flexibility

3.4. BUILD QUALITY

The walls shall be firmly constructed in metal stud partition which shall be vertically plumb and built to a true horizontal line without undulations, bumps, hollows or dives and within strict tolerances of plus or minus 1mm in 600mm and plus or minus 3mm in 1.8 metres. In the construction of the stud partition walls the vertical supports and cross supports shall be positioned to support all board joints. Timber supports may be specified in limited circumstances but to minimise the risk of cracking shall be in seasoned timber to a moisture content not exceeding that recommended in BS5268 Part 2 1984. If in doubt of the seasoned quality of the timber, specify metal studding.

The walls when boarded out shall have no discernible movement when subjected to intermittent pressures (rocking) or impact.

3.5. FIXING

The manufacturers installation recommendations for both Siniat Blueclad, H2O Power Panel and Euroform Rendaboard is for a single layer of board fixed to a suitable solid stud-work construction. The system is then reinforced with a thin bed mesh render system such as the PPX Basecoat reinforced with R160 mesh or the heavy duty R330 Panzer mesh.

This approach is entirely permissible, but it should be noted that a double layer construction will ultimately be more durable and inherently more resistant to hairline cracks in the event of impact, thermal movement or slight building movement.

It is ultimately the decision of the specifier or the client to select single- or double-layer construction.

3.5.1. Single Layer Construction

Boards shall be fixed **vertically** for **straight** walls.

Boards shall be fixed **horizontally** for **curved** and circular walls and the radius shall not be less than 4 m.

Fixings through render board are to be made using No. 6 or 8 stainless steel screws with self-embedding heads e.g. bugle heads, which must be screwed flush with the board surface (see suppliers list - section 11).

Drill pilot holes through the board before fixing to the studs. Fixings must not be positioned with centres closer than 12mm to edge of board or closer than 35mm to a corner. Fixing centres must not be more than 300mm apart.

All edges must be continuously supported over full length of each edge on 50mm minimum width studs.

The line of the boards shall be finished true with no discernible undulations, bumps, hollows or dives and within tolerances previously specified in 2.

3.5.2. Double Layer Construction

For all double layer construction, the board joints are to be staggered between layers both on horizontal and vertical joints.

Use 10mm **Bluclad** board or 12mm **Rendaboard** for first layer. Ensure that wall is detailed to prevent ingress of moisture through edges.

Bluclad is to be fixed such that the textured face is exposed for coating by Armourcoat and Rendaboard is to be fixed such that the non-glossy face is exposed for coating by Armourcoat.

Fixings through plasterboard are to be made using standard drywall screws with heads countersunk 1mm without breaking the surface of the board.

Both Bluclad boards and plasterboards shall be fixed to maintain tolerances and avoid the formation of bellies between supports. Place the first board in position and fix the first vertical edge. Press the board flat against the next vertical support and fix to it. Continue to work progressively across the wall. **DO NOT** fix both vertical edges before fixing to the intermediate supports.

3.5.3. Fixing Details Summary for Double Layered Systems

	1ST LAYER INTERIOR	2ND LAYER INTERIOR	1ST LAYER EXTERIOR	2ND LAYER EXTERIOR
Board Type	12.5mm plasterboard	10 mm Bluclad or 12 mm Rendaboard	10mm Bluclad or 12mm Rendaboard	10mm Bluclad or 12mm Rendaboard
Treatment	None	Apply 4-6mm of PPX basecoat to surface. Whilst wet embed the R160 Mesh and apply a further 1-2mm of PPX basecoat	None	Apply 4-6mm of PPX basecoat to surface. Whilst wet embed the R160 Mesh and apply a further 1-2mm of PPX basecoat
Screw length Use No. 6 or No. 8	Drywall 25mm into metal stud 38mm into timber stud	Stainless steel self-embedding head.	Drywall 25mm into metal stud 38mm into timber stud. Bluclad/Rendaboard - same as 2nd layer fixing requirements	Stainless steel self-embedding head. 38mm into metal stud 50mm into timber stud
Width of stud to fix into	50mm minimum	50mm minimum	50mm minimum	50mm minimum
Maximum Support Spacing	Flat wall 600mm Curved wall 300mm	Flat wall 600 mm	Flat wall 600mm Curved wall 300mm	Flat wall 600mm Curved wall 300mm
Fixing Centres	300mm maximum	300 mm maximum	300mm maximum	300mm maximum
Board Joint Gaps	None	None	None	None

3.6. BEADING

3.6.1. Internal Corners

Ensure that internal corners are reinforced with the R160 or R330 mesh.

3.6.2. External Corners

Unlike normal skim coat plastering where the apex of the corner bead sits flush with the finish, Polished Plaster looks better if the finish is applied continuously around the corner. Wemico 3797 or Wemico 3752 for splayed angles.

For corners where corner damage can be anticipated, consider wood or metal end posts or cappings.

3.6.3. Feature Beads

Plastering beads are available from British Gypsum Ltd (Tel 0800 225225), SAS (Tel 0118 9290900), QIC Trims (Tel 01280 818950) or Wemico (Tel 01562 820123). For detailing drawings please refer to the end of this document.

3.6.4. Supplier List

Bluclad Cement Fibre Board:

Siniat UK Tel: +44 (0) 1275 377773

www.siniat.co.uk

Fermacell H2O Power Panel Boards:

James Hardie Europe GmbH

Export Department

Bennigsen-Platz 1

40474 Düsseldorf

Germany

Email: fermacell-exportcenter@jameshardie.com

Contact for Export, UAE, Middle East and international inquiries:

James Hardie Europe GmbH

Export Department

Bennigsen-Platz 1

40474 Düsseldorf

Germany

Email: fermacell-exportcenter@jameshardie.com

www.fermacell.com/en/products/powerpanel/powerpanel-h2o

Euroform Rendaboard:

Euroform UK Tel: +44 (0) 1925 860999

www.euroform.co.uk

Stainless Steel Self Embedding Head Screws:

I.T.W.Buildex Tel: +44 (0) 1293 523372

Arthur Fischer Tel: +44 (0) 1491 827900

Angle Beads:

Wemico +44 (0) 1562 820123

SAS Tel: +44 (0) 1189 290900

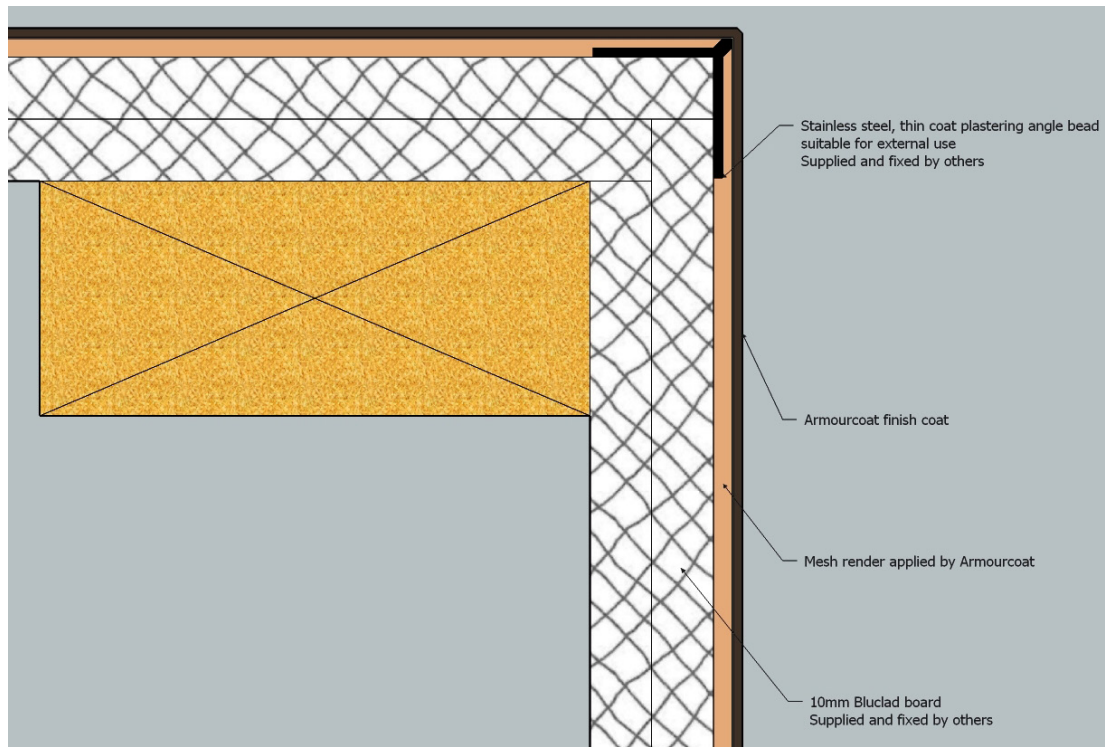
British Gypsum Tel: +44 (0) 800 225225

QIC Trims Tel: +44 (0) 1280 818950

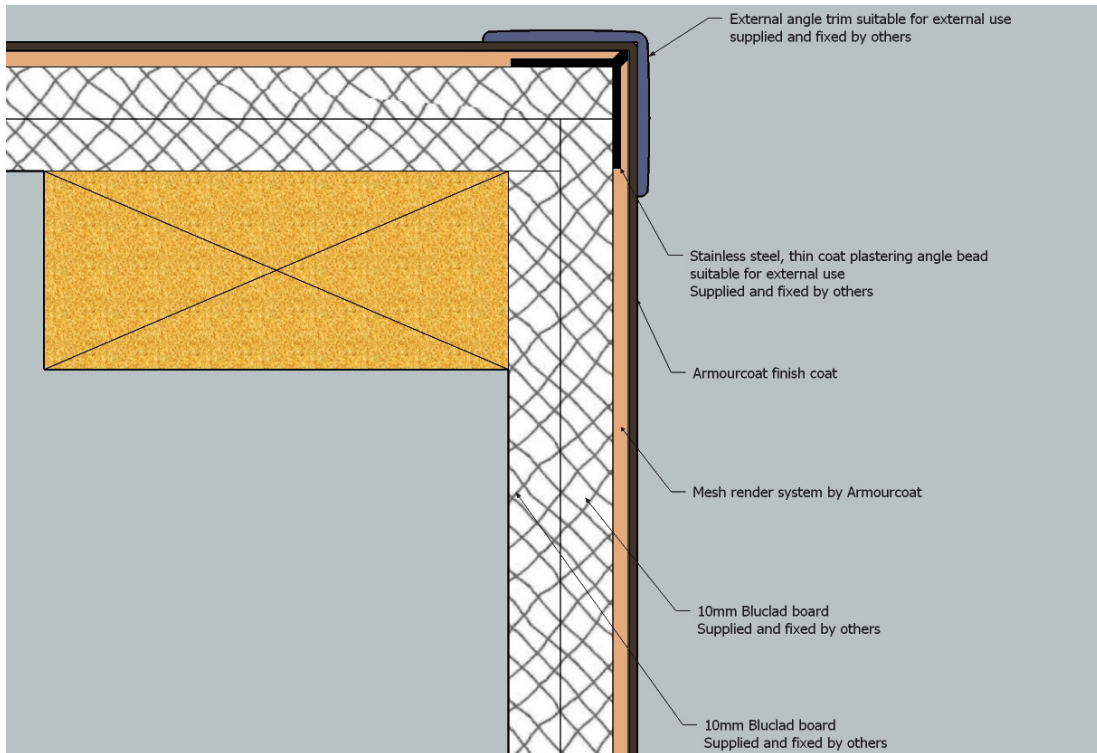
3.7. DIAGRAMS

The specification is for guidance only. It describes good working practice. It does not claim to be the right or only method to provide a solid substrate and is made without responsibility for the execution of the work. Build quality is the responsibility of the installer/builder.

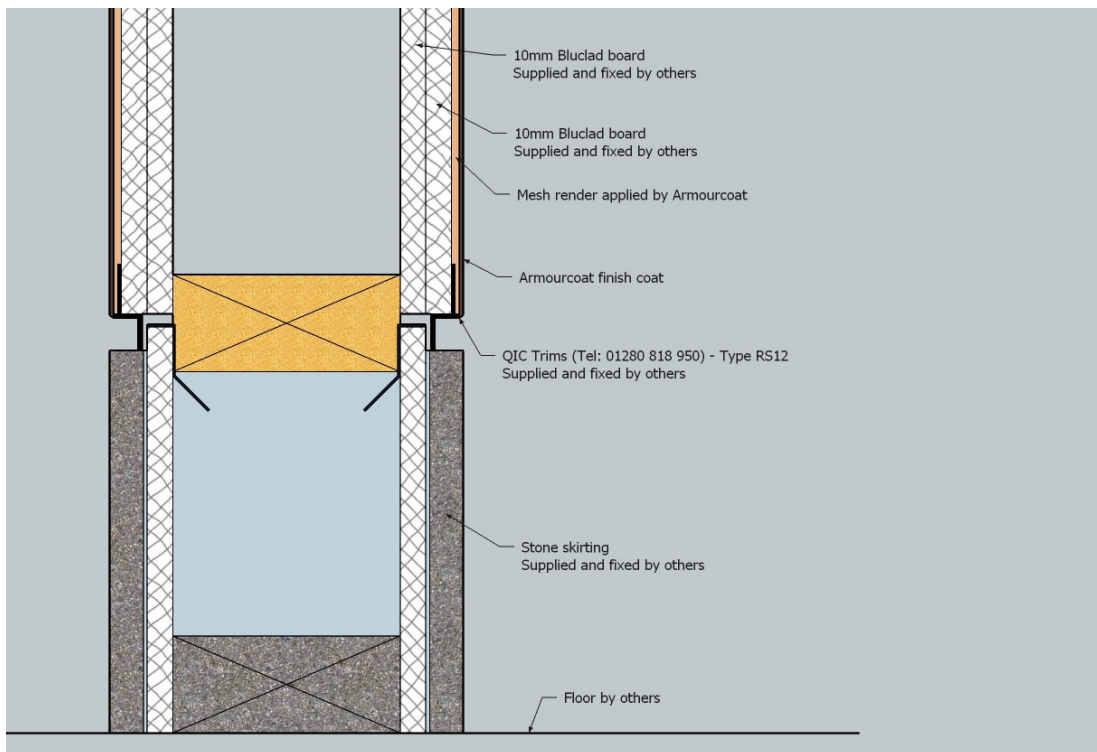
3.7.1. 90 degree corner detail for Armourcoat finishes on render board substrates



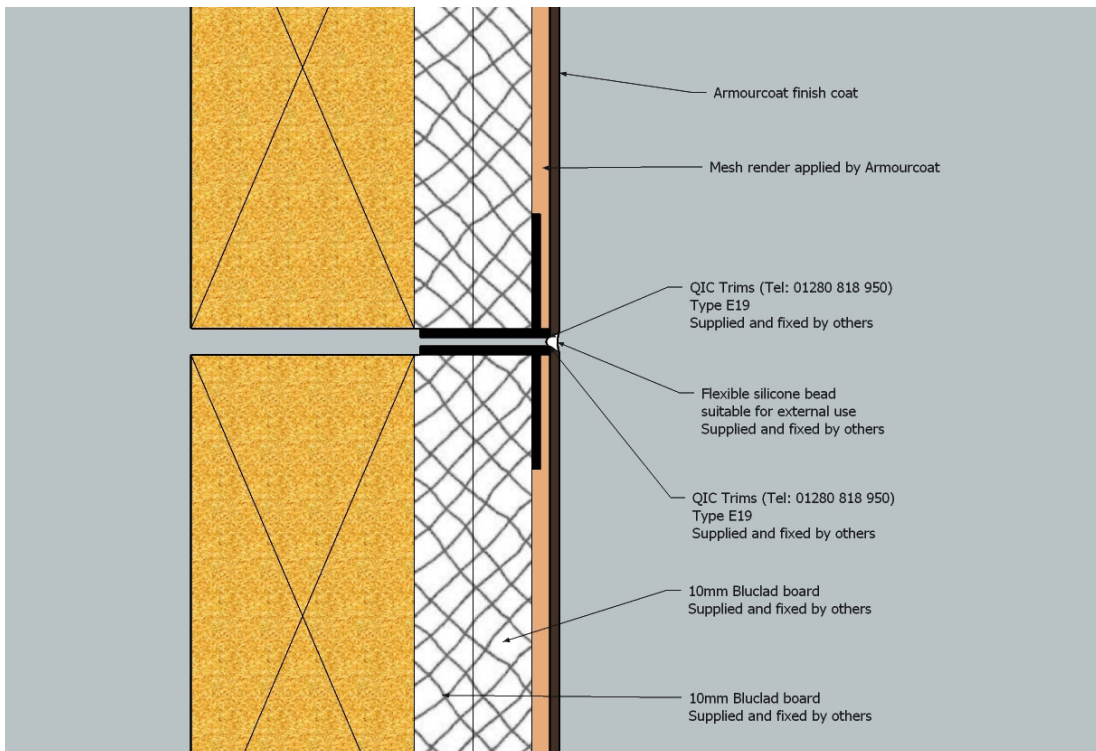
3.7.2. 90 degree corner with protective angle detail for Armourcoat finishes on render board substrates



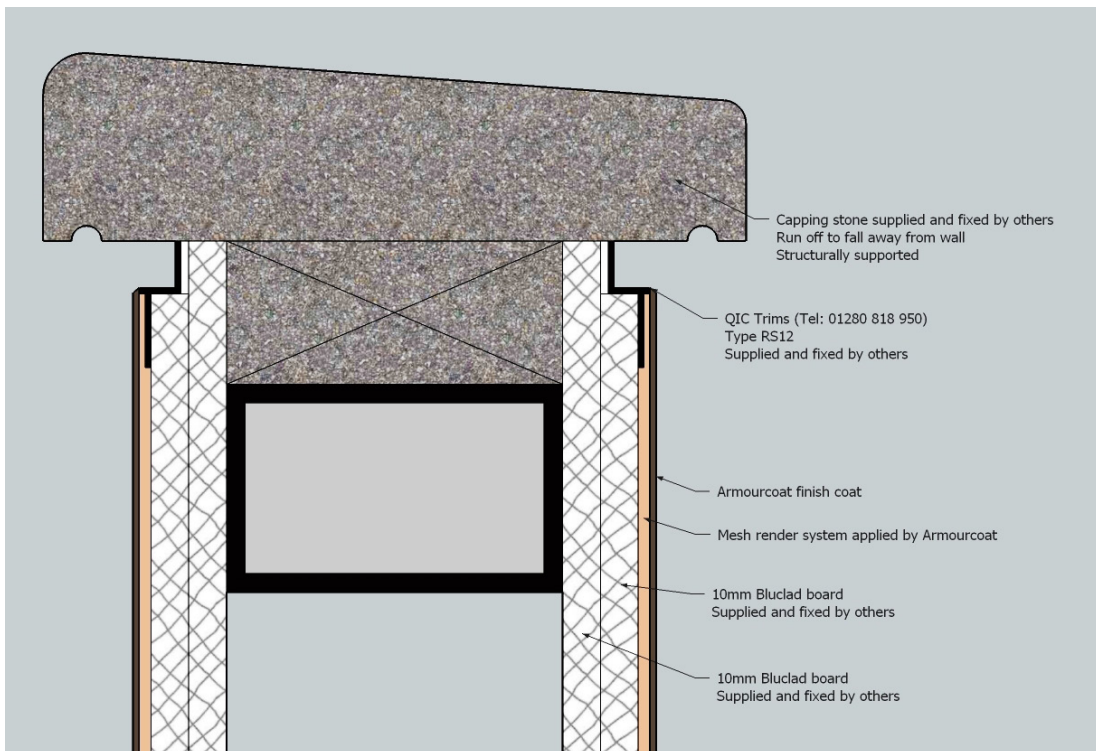
3.7.3. Skirting detail for Armourcoat finishes on render board substrates



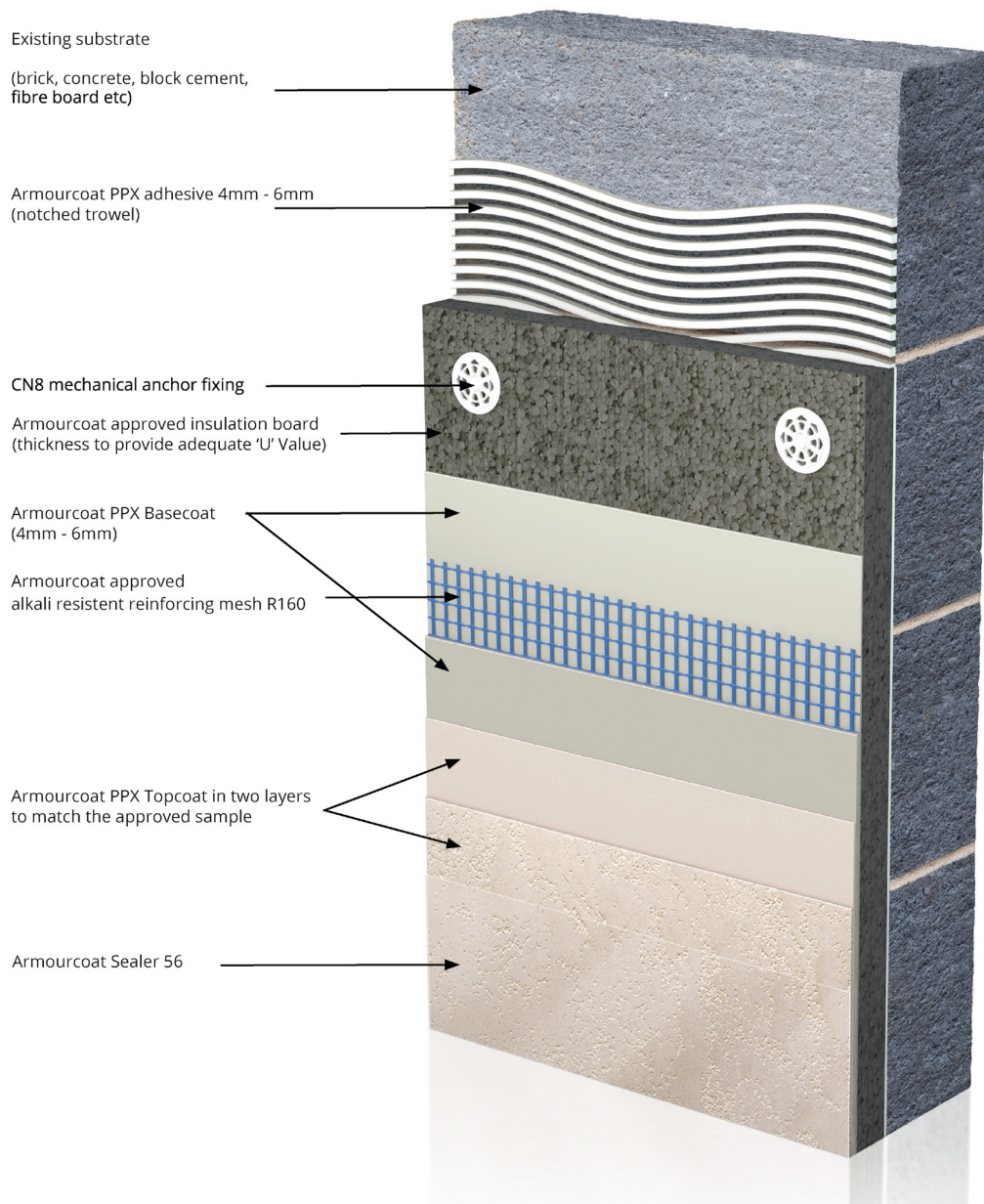
3.7.4. Expansion joint detail for Armourcoat finishes on render board substrates



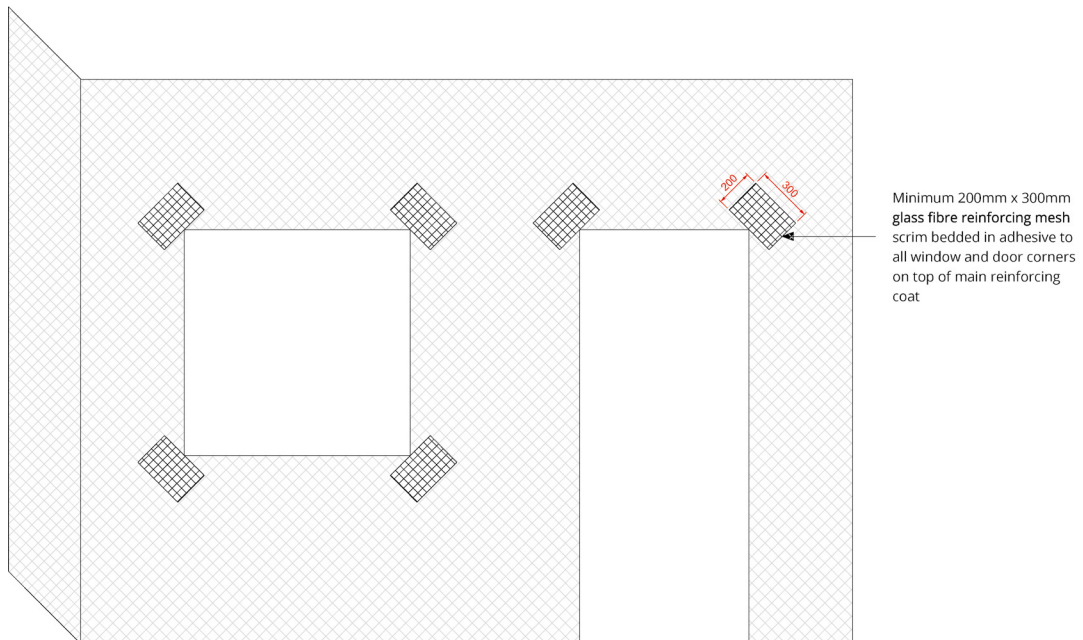
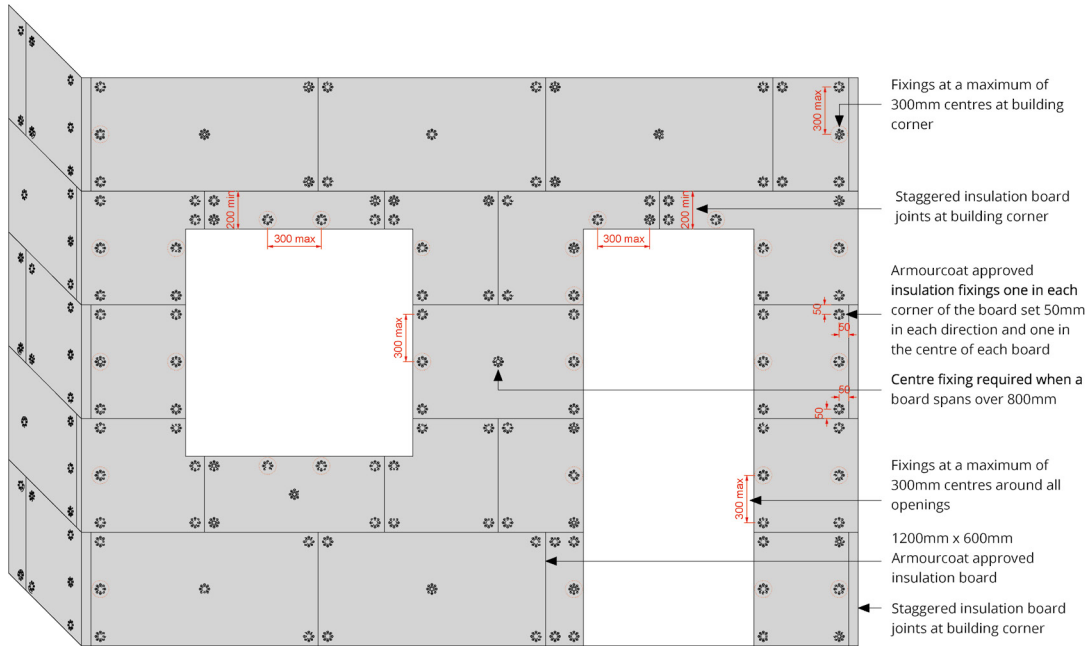
3.7.5. Capping stone detail for Armourcoat finishes on render board substrates



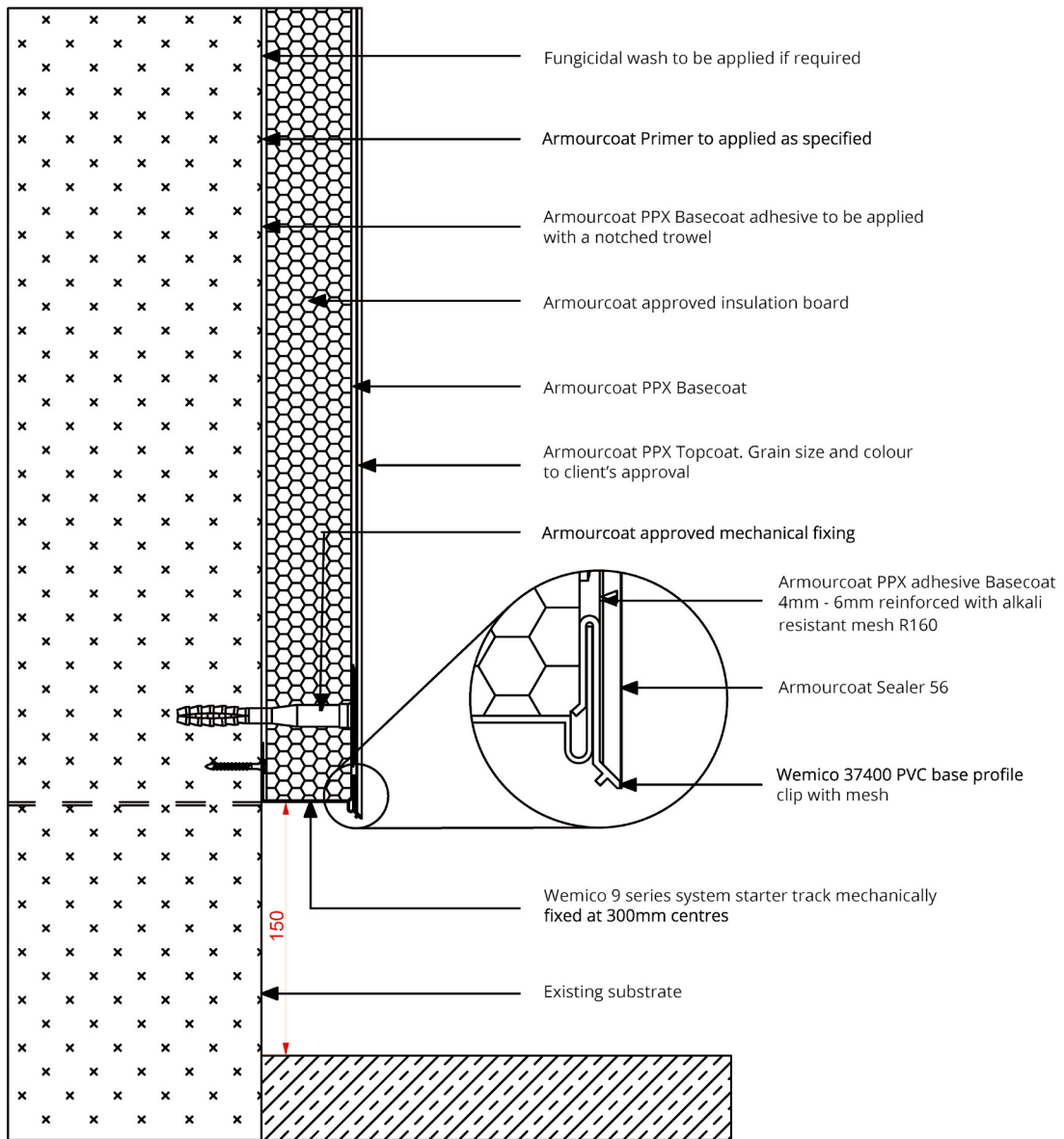
3.7.6. EWI System Diagrams Substrate build-up



3.7.7. Fixing Arrangement

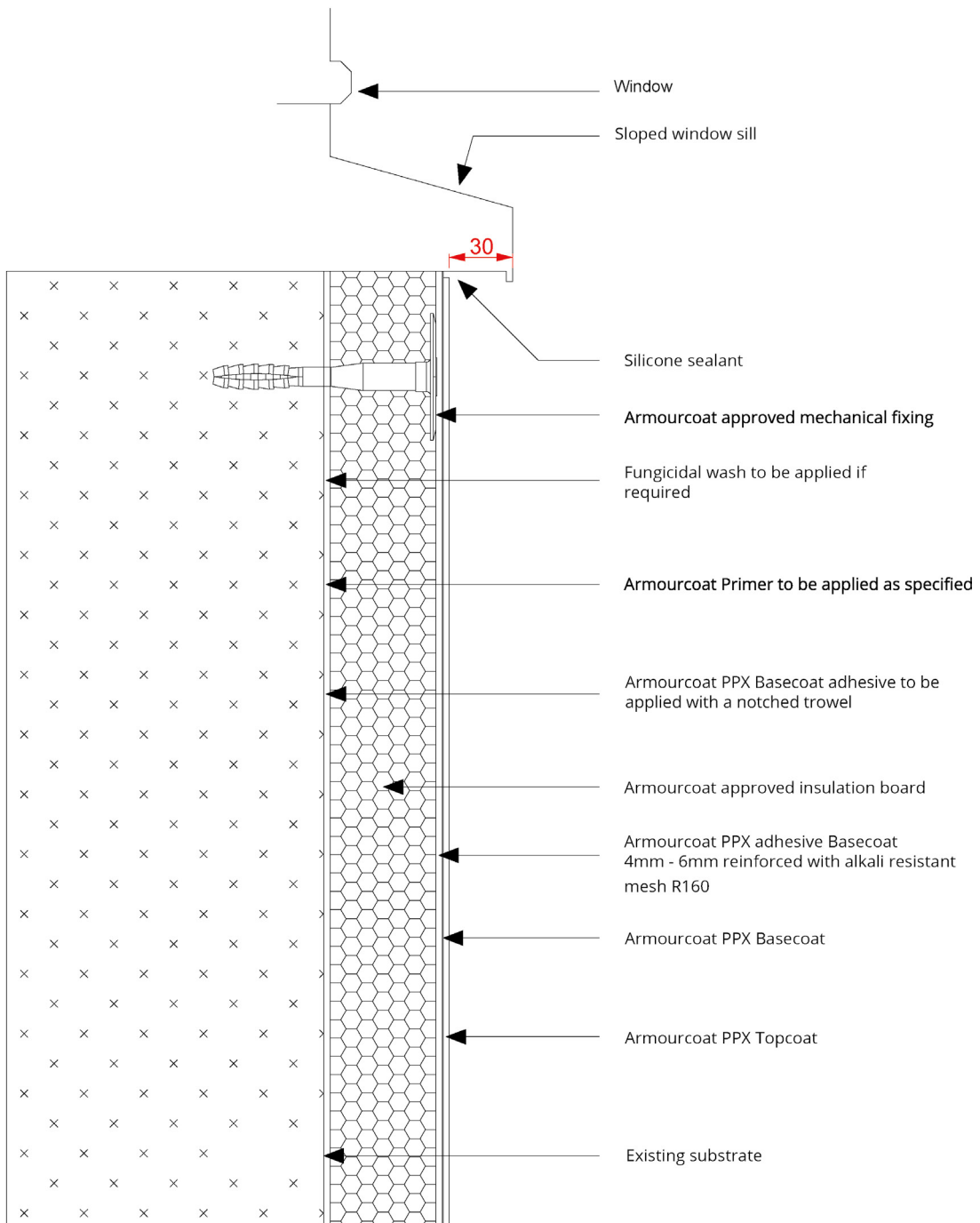


3.7.8. Base bead details

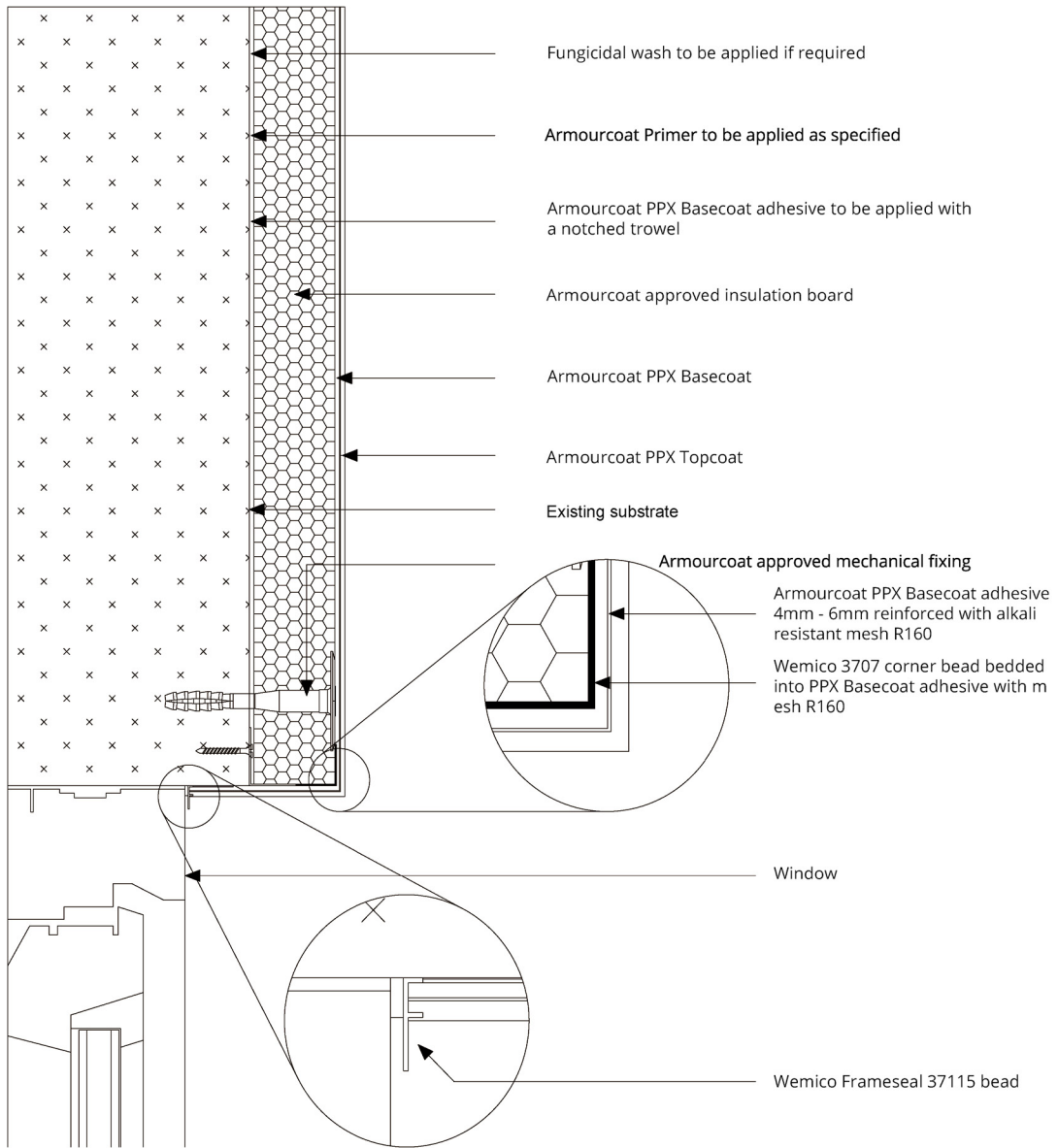


Ground level may vary. Base bead to be kept at least 150mm above ground level. NB: Damp proof course must not be bridged

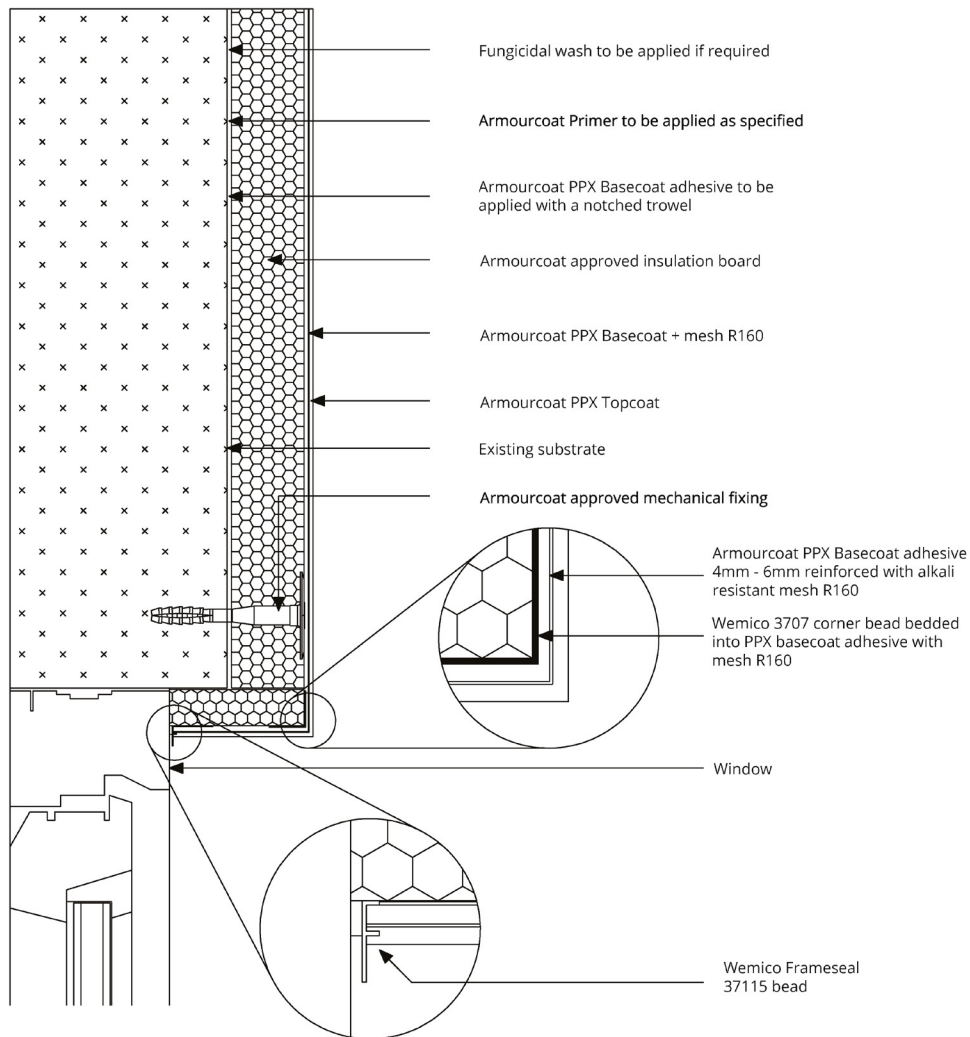
3.7.9. Window Sill



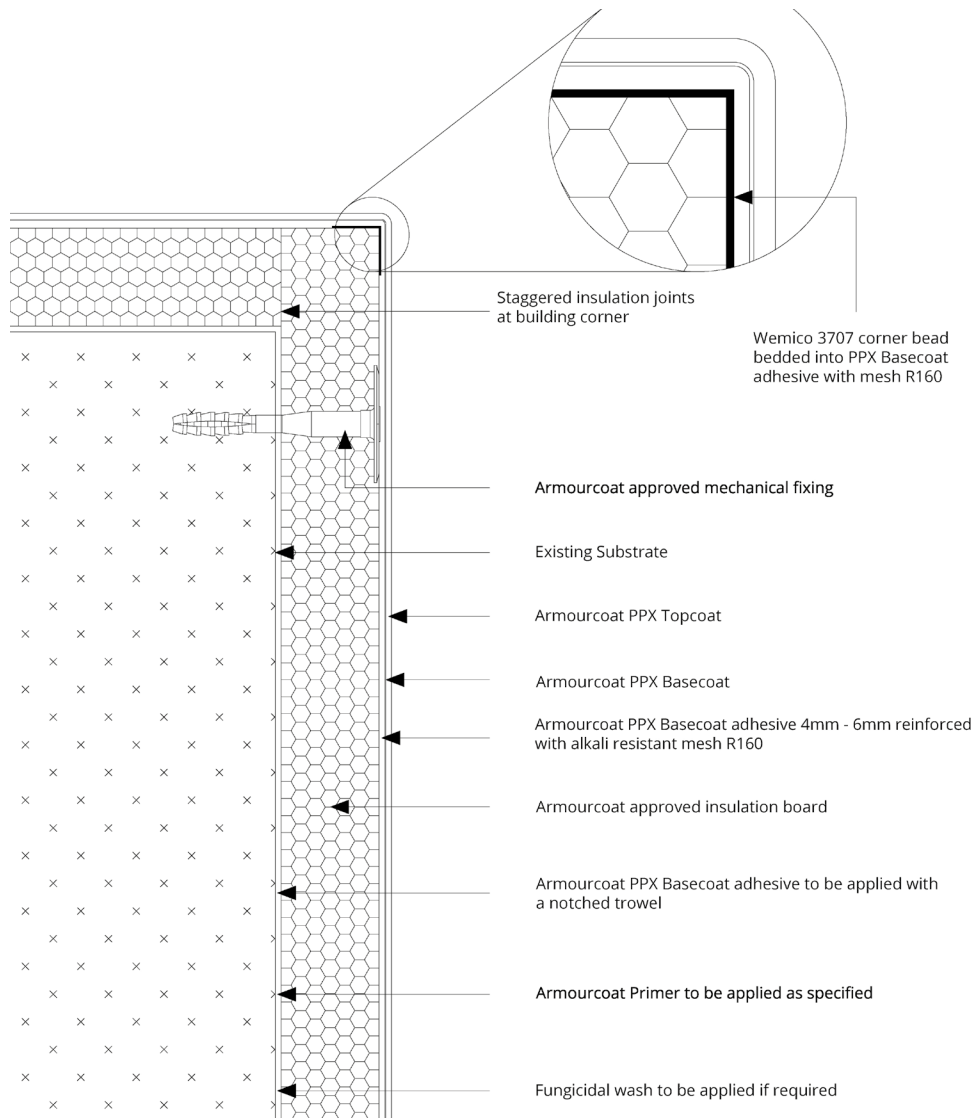
3.7.10. Windows/Door head detail (1)



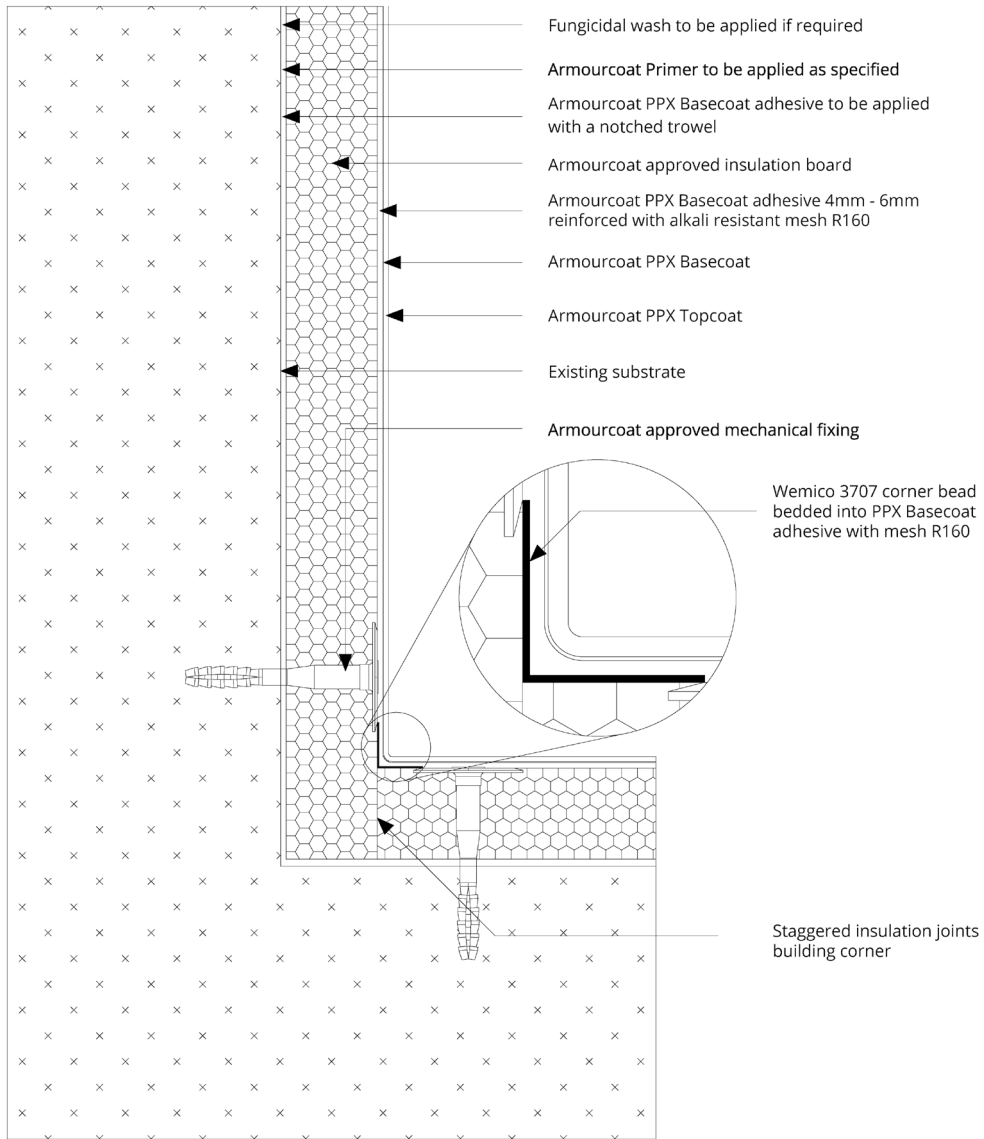
3.7.11. Windows/Door head detail (2)



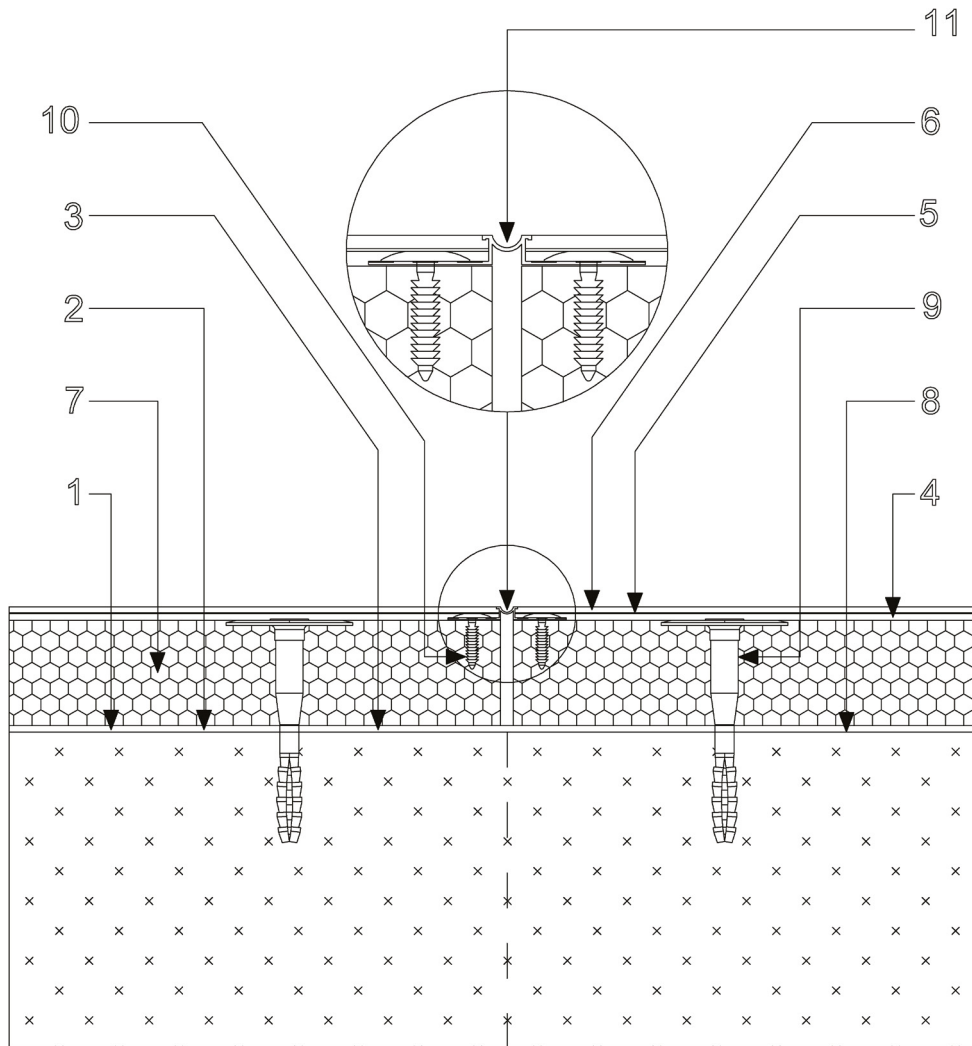
3.7.12. Building external corner



3.7.13. Building internal corner

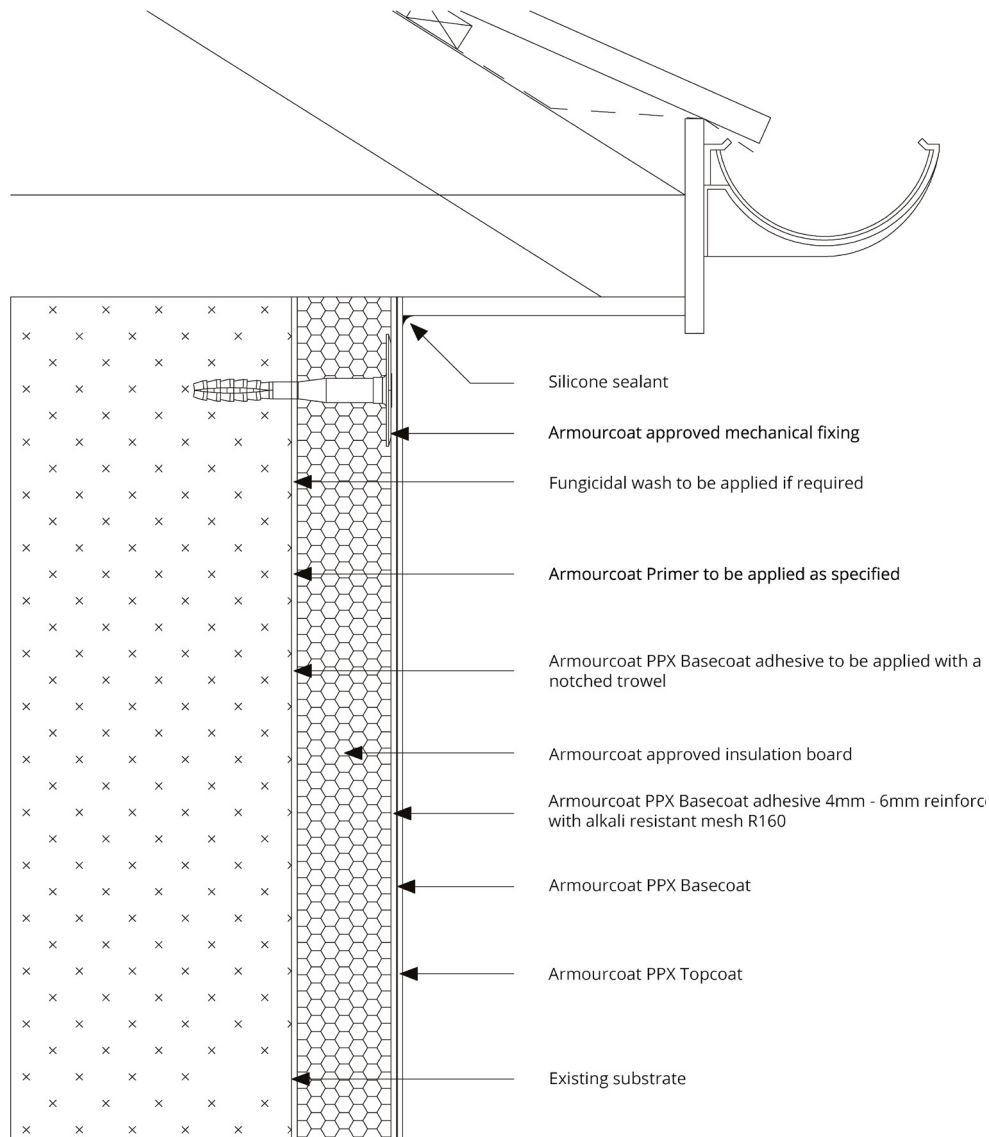


3.7.14. Movement joint

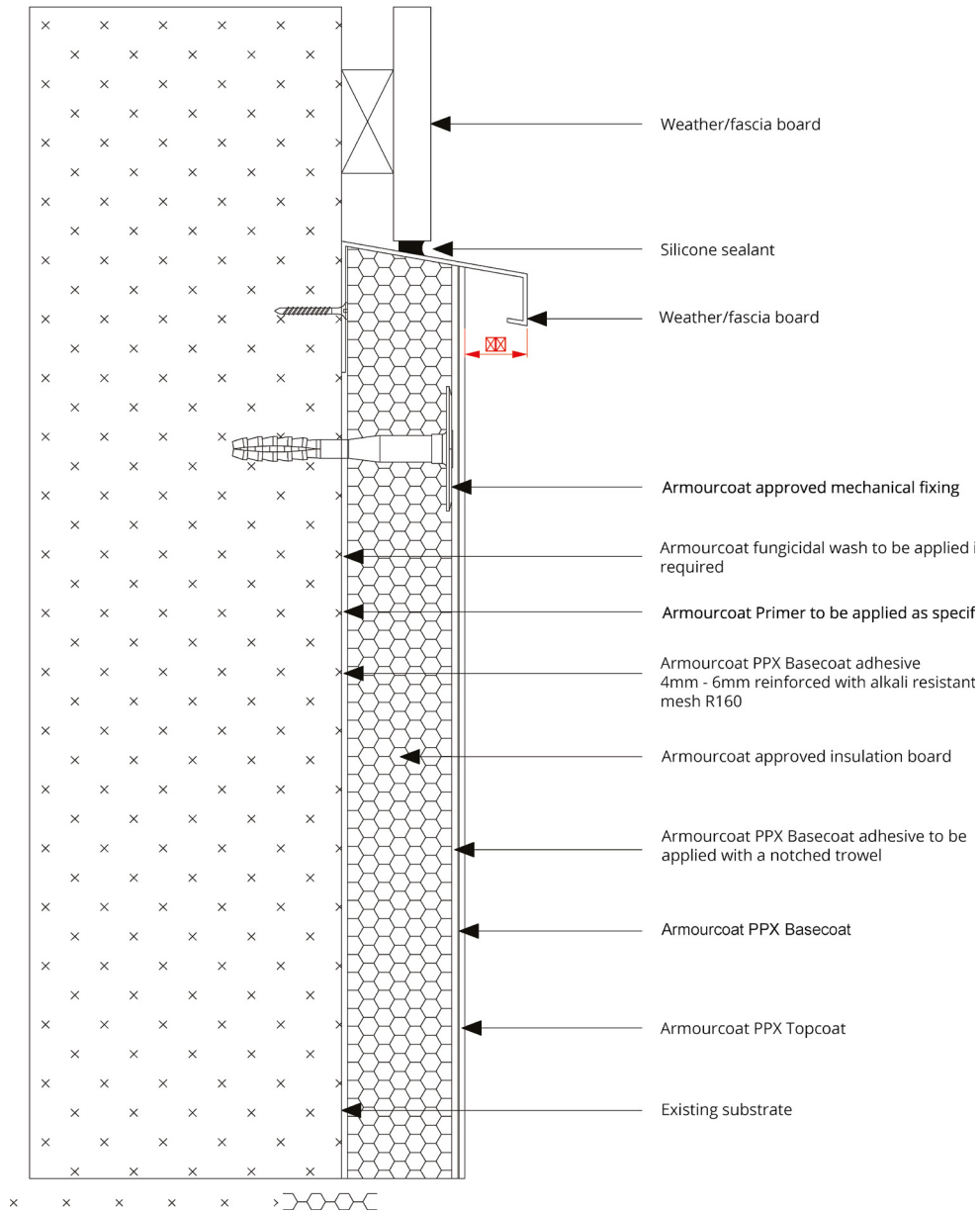


- | | |
|--|---|
| 1. Fungicidal wash to be applied if required | 6. Armourcoat PPX Topcoat |
| 2. Armourcoat Primer to be applied as specified | 7. Armourcoat approved insulation board |
| 3. Armourcoat PPX Basecoat adhesive to be applied with a notched trowel | 8. Existing substrate |
| 4. Armourcoat PPX Basecoat adhesive 4mm - 6mm reinforced with alkali resistant mesh R160 | 9. Armourcoat approved mechanical fixing |
| 5. Armourcoat PPX Basecoat | 10. 'Fir Tree' fixings at minimum 300mm centres |
| | 11. Wemico PVC movement bead |

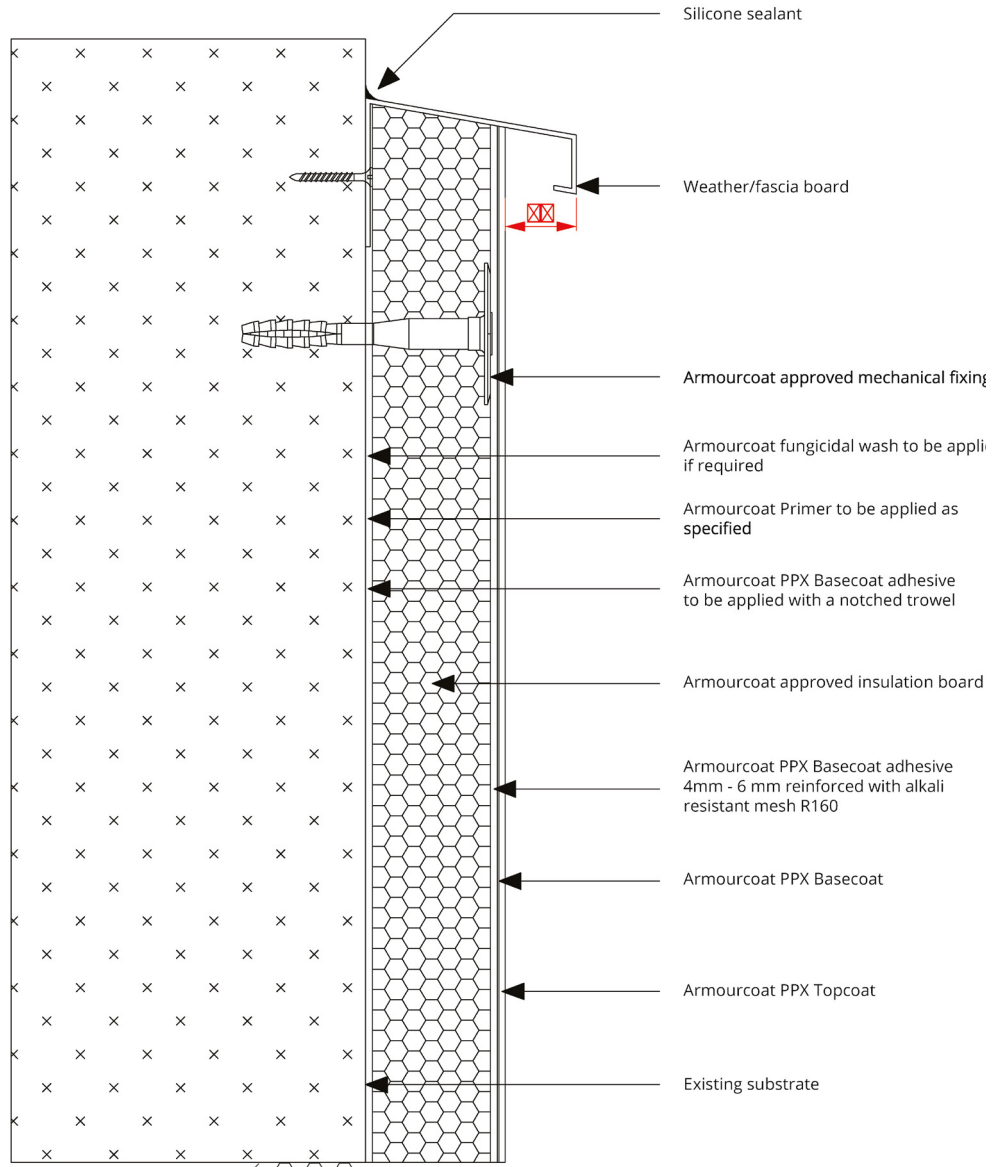
3.7.15. Roof abutment



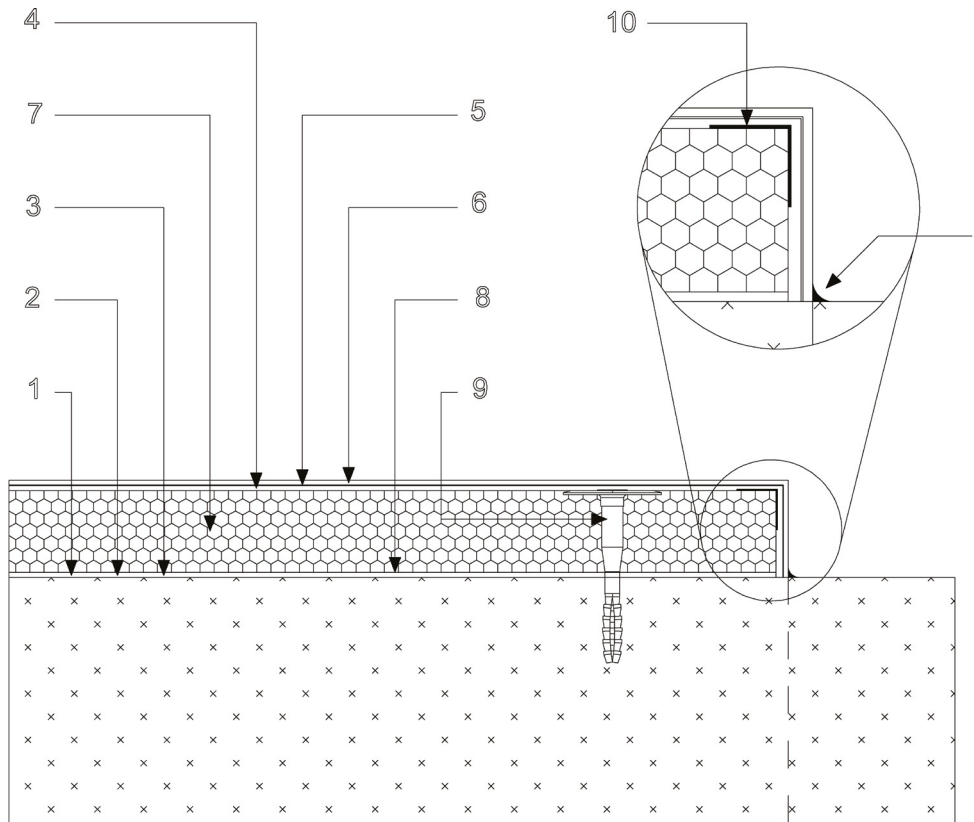
3.7.16. Verge (1)



3.7.17. Verge (2)

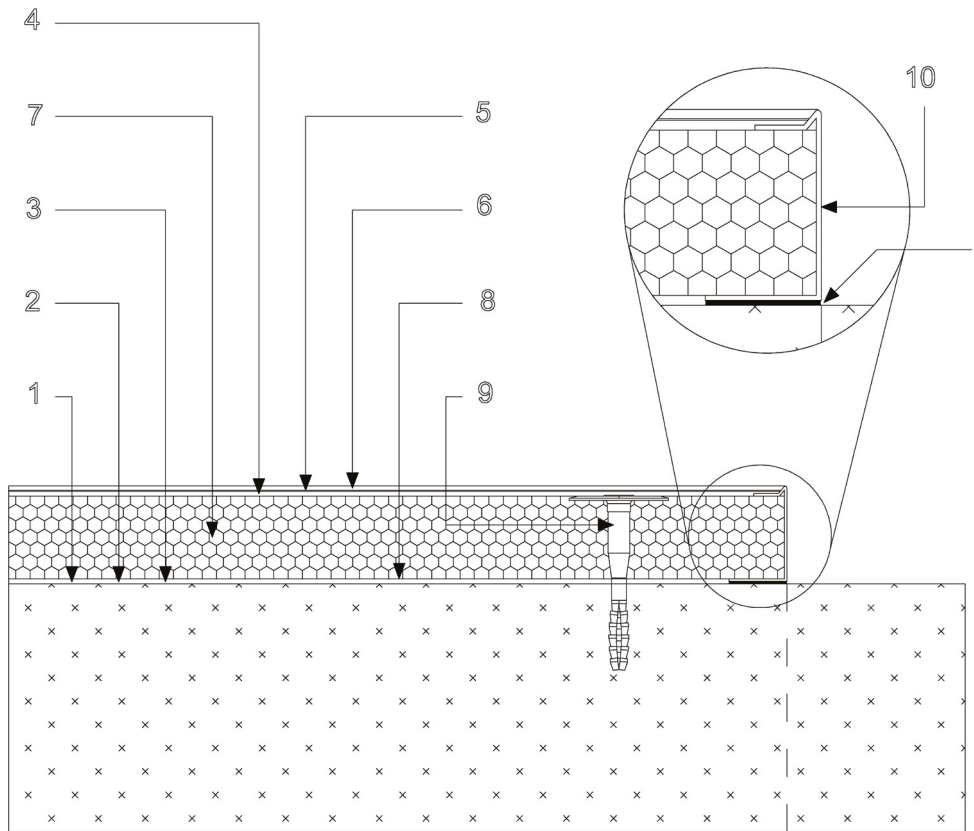


3.7.18. Party wall (1)



- | | |
|---|---|
| 1. Armourcoat fungicidal wash to be applied if required | 6. Armourcoat PPX Topcoat |
| 2. Armourcoat Primer to be applied as specified | 7. Armourcoat approved insulation board |
| 3. Armourcoat PPX Basecoat adhesive to be applied with a notched trowel | 8. Existing substrate |
| 4. Armourcoat PPX basecoat adhesive 4mm - 6mm reinforced with alkali resistant mesh | 9. Armourcoat approved mechanical fixing |
| 5. Armourcoat PPX Basecoat | 10. Wemico 9245 full depth stop bead fixed at 300mm centres |
| | 11. Silicone sealant |

3.7.19. Party wall (2)



- | | |
|--|---|
| 1. Fungicidal wash to be applied if required | 6. Armourcoat PPX Topcoat |
| 2. Armourcoat Primer to be applied as specified | 7. Armourcoat approved insulation board |
| 3. Armourcoat PPX Basecoat adhesive to be applied with a notched trowel | 8. Existing substrate |
| 4. Armourcoat PPX Basecoat adhesive 4mm - 6mm reinforced with alkali resistant mesh R160 | 9. Armourcoat approved mechanical fixing |
| 5. Armourcoat PPX Basecoat | 10. Wemico 9245 full depth stop bead fixed at 300mm centres |
| | 11. Silicone sealant |

4. CARE AND MAINTENANCE

4.1. CLEANING

Armourcoat PPX will over time accumulate airborne dirt and dust onto the surface which needs to be cleaned off. Wet down the surface with a hose or water spray prior to washing the surface. The surface can then be washed using a mild detergent solution that is applied to the surface with a sponge, soft brush or mop.

Wash the surface and then rinse with clean water with a hose or a power washer. When using a power washer please ensure that you use a fan shaped pattern and the tip of the power washer is never closer than 200mm to the surface.

When washing or cleaning the surface look out for any areas of the surface that begin to darken due to the uptake of water. These areas will require a spot application of the sealer or surface impregnator once they have dried out.

Do not use abrasive cleaning pads like pan scourers on the surface as this may abrade the surface sealer.

Under no circumstances use acid-based cleaners for this process, as they may cause permanent damage to the walls.

4.2. INSPECTION

The surface should be inspected on an annual basis to check for surface damage, movement cracks and any signs of moisture ingress at window and door openings.

All silicone seals at window frames and interfaces with other materials should be inspected and repaired if required to avoid any ingress of water into the building.

4.3. DAMAGE AREAS

If the surface of the PPX is chipped or damaged it should be repaired and the surface sealer reapplied. If a particular area is damaged very severely it may not be possible to make good the surface and a reapplication of the finish is required. The reapplication of the finish coat will add approximately 1-2mm to the final surface.

If you see areas that are darkening or staining, it may be that water is penetrating the finish. In this case it is important that the sealer originally used in the PPX system is reapplied over that area. Armourcoat recommends that every 10 years the surface is fully cleaned and the surface sealer reapplied over the entire surface.

5. WARRANTY

5-year materials warranty for exterior use.