



# WHAT'S CHANGED IN THE 2024 TECHNICAL MANUAL

# Introduction

Welcome to the 'What's Changed' document for the latest version of our Technical Manual.

This document outlines some of the key changes that we feel you need to be aware of in each section of the Manual.

These changes apply to the new LABC Warranty v12 Technical Manual, published on 1st April 2024.

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# Ground Conditions

## 1. Updated Functional Requirement regarding site investigation completion dates

We have updated the Functional Requirement Design note 1 to now include text explaining that all site investigations must be dated within 5 years of any construction starting on site.

The Functional Requirement now states:

### Design

- The site investigation should be completed at an appropriate level for the risk in accordance with the relevant British Standard. **All site investigations must be dated within 5 years of construction starting on site.**

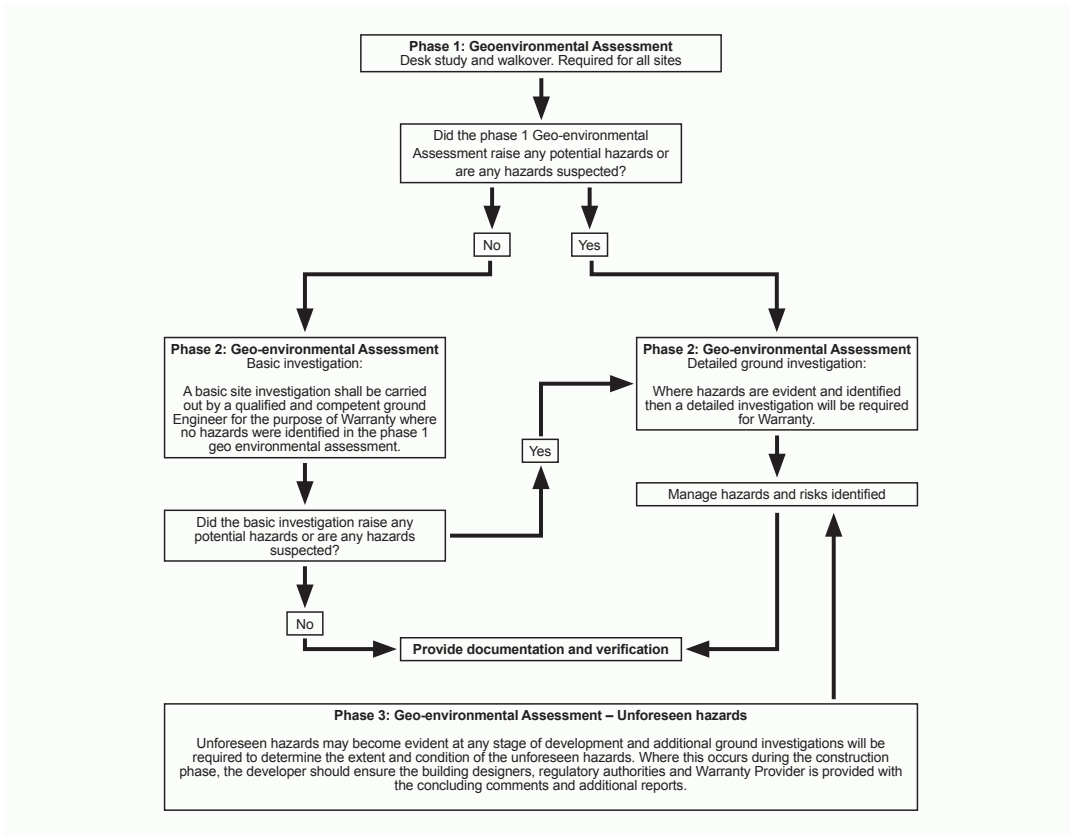
This requirement has also been stipulated in section 1.1.1 in the 'Provision of information' paragraph.

## 2. Simplified guidance throughout the section, including updated flow chart

Section 1 has undergone a general refresh/reorder, including removing information which isn't required and making existing guidance easier to understand.

As part of the refresh, we have updated the 'Site Investigation procedures' flow chart in section 1.1.1, to make it easier to use/follow.

Have a look in the new Technical Manual to familiarise yourself with the simplified guidance in this section.



# Basements

## 1. Section 2.2 is now called 'Basements - Waterproof Protection Systems'

Section 2.2 of the previous Technical Manual was titled 'Basements - Waterproofing Systems'. We have now changed this to be called 'Basements - Waterproof Protection Systems' to better categorise the guidance within.

## 2. Updated Functional Requirement Design note 1

Previously, the Functional Requirement Design note 1 stated that 'The Foundations and basement retaining walls shall be designed by an Engineer to support vertical loading, resist horizontal loading and surcharges including the influence of nearby trees and topography.'

The new Design note 1 states:

### Design

1. Elements that are integral to the waterproofing structure of basements including foundations, walls and floors shall be designed by an Engineer to support vertical loading, resist horizontal loading and surcharges including the influence of nearby trees and topography.

## 3. New text regarding ground gases and contaminants within the risk assessment

In section 2.1.2, we currently have text discussing how ground gases and contaminants must be considered within the risk assessment for the waterproofing design. We have now added to that text, stating that an Engineer with suitable knowledge and experience may need to be consulted.

The new guidance can be found under the 'Site investigation to determine ground conditions' heading, and is as below.:

Ground gases and contaminants must also be considered within the risk assessment for the waterproofing design. The Waterproofing Design Specialist may need to consult with an Engineer with suitable knowledge and experience with ground gases and contaminants.

## 4. New text stating that 'type A' barrier membranes must be fully bonded

In section 2.1.3, we have clarified that barrier membranes **must** be fully bonded.

The additional guidance is highlighted below:

BS 8102 refers to three forms of waterproofing protection:

- Type A Barrier protection (can be referred to as 'tanking'). **Barrier membranes must be fully bonded.**
- Type B Structurally integral protection.
- Type C Drained protection (can be referred to as 'water management').

## 5. Updated text regarding which environmental grade of waterproofing should be chosen in various environments

In section 2.1.4 of the previous Technical Manual, under the heading 'Grades of waterproofing protection', we provided guidance stating that "For Warranty purposes we require all basements to be designed and constructed to a minimum of Grade 2, with Grade 3 being necessary for habitable space.". This has been updated to state that:

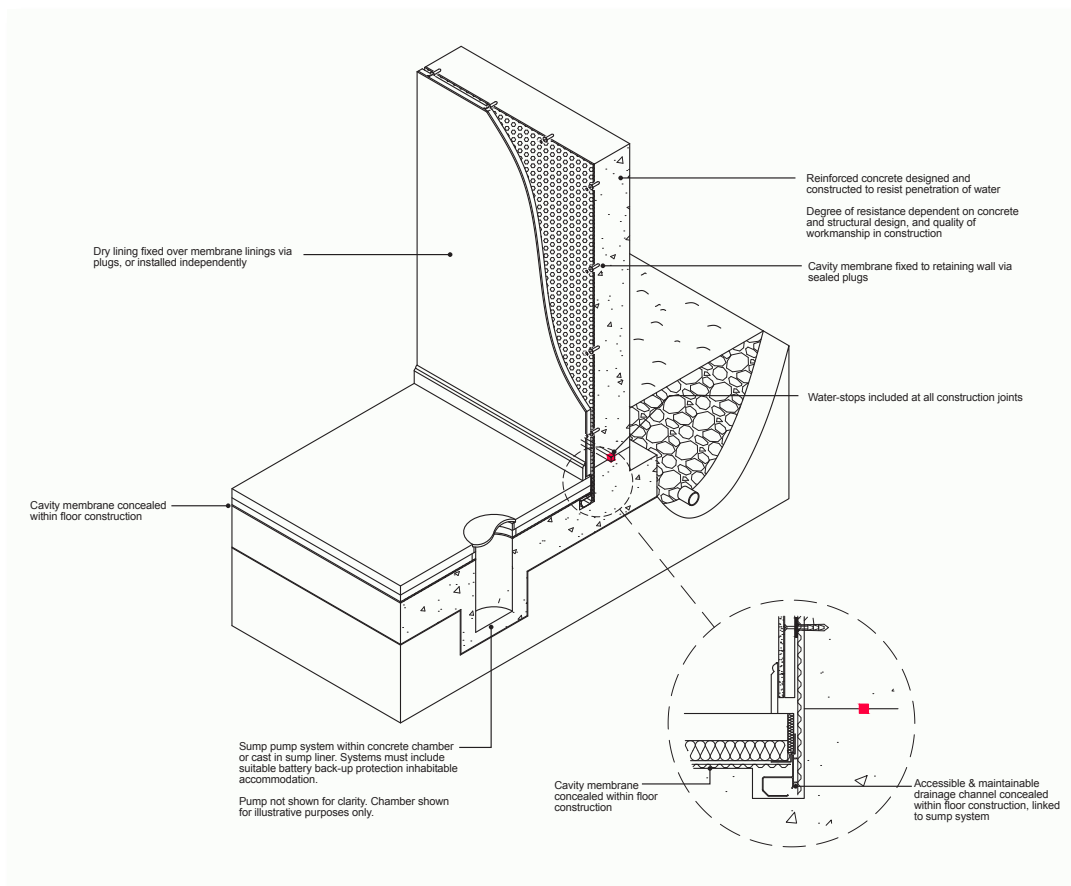
- All waterproofing design specialists should clearly define the environmental grades being applied to the spaces within any basement storey as part of their waterproofing strategy.

This change has been made to make our guidance more clear in relation to what grades should be chosen for various environments.

## 6. Update to the 'Typical example of a combined system - Type B+C' detail

In section 2.2.7, we have rotated our detail titled 'Typical example of a combined system - Type B+C' to better show the detailing and what we require.

The new detail is as below:



# Foundations

## 1. We have combined our guidance for Strip and Mass Fill Foundations

As the guidance in section 3.1 'Foundations - Mass Fill' and section 3.2 'Foundations - Strip' of the previous Manual was very similar, we decided to combine it into one new section. So, we now have a new section 3.1 called 'Foundations - Mass Fill and Strip'. Though the guidance hasn't completely changed, take some time to familiarise yourself with the new layout of the section.

As a result of this, the other existing sub-sections within section 3 will have new numbers as below:

Old sub-sections	➔	New sub-sections
3.1 Mass Fill		3.1 Mass Fill and Strip
3.2 Strip		3.2 Piles
3.3 Piles		3.3 Raft
3.4 Raft		3.4 Engineered Fill
3.5 Engineered Fill		3.5 Vibratory Ground Improvement
3.6 Vibratory Ground Improvement		3.6 Trees and Clay
3.7 Trees and Clay		

## 2. New guidance added for flexible and rigid retaining walls

In the new sections 3.1.1, 3.2.3, 3.3.2, 3.4.2, and 3.5.3, we have added new guidance explaining our requirements where flexible or rigid retaining walls are specified. The guidance is as below:

### Flexible retaining walls

For the purposes of Warranty, flexible retaining walls may be defined as walls that support soil laterally whilst allowing deformations of the unsupported edge of the flexible retaining wall. Examples of flexible retaining walls include gabion, crib, block, timber or modular retaining wall systems.

Flexible retaining walls should not be used to support the structure of the property, garages, roads, drives, car parking areas or drainage systems.

### Rigid retaining walls

Where rigid retaining walls are specified which support the foundations of a building, an Engineers design must be provided to confirm capable of maintaining stability for a period of at least 60 years and all works to the rigid retaining wall should be completed prior to works for the foundations of the property starting.

## 3. Note added to the 'Provision of information' for pile foundations

In section 3.2.1 we have added the following note below our provision of information:

Please note: In the absence of approval, works are proceeding at the Developer's own risk.

## 4. New note explaining that our guidance is also for shrubs and hedgerows in 3.6.1

In the previous Technical Manual, we stated that the guidance in this section is for where foundations are built near trees. Though correct, the guidance in this section is **also** for when building near hedgerows and shrubs. As a result we have updated the text to read:

The following guidance is provided for foundation design when building near trees, hedgerows or shrubs.

## 5. Updated 'Provision of information' for raft foundations

In the new section 3.3.1 for raft foundations, we've updated our 'Provision of information' to provide a more detailed list for the information we require prior to works starting on site. The updated guidance is as below:

A full set of design drawings, calculations and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

1. Phase 1 Desk Study Report and Phase 2 Geotechnical Site Investigation Reports including site-specific recommendations for raft foundations (and allowable bearing pressures) to ensure long term settlement does not exceed 25mm or 1/500 (differential).
2. Structural drawings:
  - a) GA and RC drawings, including a drawing register sheet.
  - b) Details of internal and external thickening to cater for loadings and the effects of frost.
  - c) Details of any insulation beneath the raft.
3. Structural calculations:
  - a) Demonstrating that the ground bearing pressure does not exceed the allowable value specified in the Site investigation report. Localised areas of higher bearing pressures (e.g. beneath load-bearing walls, thickening or point loads) should be considered.
  - b) Demonstrating that the raft (i.e. the thickening, slab and beams) can span a 3.0 metre 'soft spot' and cantilever 1.5 metres.
  - c) Demonstrating the adequacy of any insulation beneath the raft (in relation to loadings, creep and groundwater). The insulation must have appropriate 3rd party approval certification and compressive creep must be limited to a maximum 2% reduction for a 50/60 year period.
4. Plans and details of the proposed raft showing reinforcing positions and a bar schedule, to be used by the reinforcing steel supplier and installer.
5. Confirmation that all made ground and organic matter beneath the foundation has been or shall be removed/replaced with appropriate material, or treated.
6. Details of engineered granular fill below the raft (including its depth and lateral extent, ensuring a 45° spread from the edge), along with its compaction specification, testing and Geotechnical Engineer's validation. Where Manual for Highway Works (MHW) specification for engineered granular fill is indicated, details shall conform with MHW Volume 1 Series 600 Earthworks Cl:610 'Fill to Structures'.
7. Calculations demonstrating how the depth of granular fill has been determined to cater for the effects of heave and shrinkage (if shrinkable soils are present).
8. Details of any ground treatment (e.g. vibro treatment, cement-lime stabilisation etc.).

Please note: if there are queries with regard to anything not covered or it is intended to deviate from the above guidance, then please contact the Warranty Surveyor for agreement prior to commencement. Following acceptance of the proposals, please refer back to the Warranty Surveyor if anything is subsequently discovered on site, which affects the design and/or construction of the raft.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

## 6. Updated 'Provision of information' for engineered fill

In the new section 3.4.1 for engineered fill, we've updated our 'Provision of information' to provide a more detailed list for the information we require prior to works starting on site. The updated guidance is as below:

A full set of design drawings, calculations and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

1. Site Investigation Reports including site-specific recommendations for foundations to ensure long term settlement does not exceed 25mm (10mm for piles) or 1/500 (differential).
2. Structural drawings:
  - a) Site layout plan including proposed finished floor levels for all plots.
  - b) Topographical survey confirming existing ground levels. Subsequent site level surveys indicating areas where earthworks are required to achieve final construction levels. If piling or ground improvement techniques are to be adopted, piling platform and/or vibro platform levels are required.
  - c) GA and RC drawings, including a drawing register sheet.
  - d) Piling & Vibro layout drawings (if applicable), including a drawing register sheet.
  - e) The design of the dwellings should allow a degree of articulation with movement joints sufficient to accommodate the maximum allowable differential settlement above, also at thresholds and service entries.
3. Structural calculations:
  - a) Demonstrating that the ground bearing pressure does not exceed the allowable value specified in the Site Investigation Report.
  - b) Piled foundation calculations (please refer to the 'Piling Good Practice Guide' available on our website).
  - c) Vibro foundation calculations (please refer to the 'Piling Good Practice Guide' available on our website).
4. Earthworks Specification including:
  - a) Confirmation that works are supervised by a suitably experienced independent Chartered Geotechnical Engineer.
  - b) Proposals for load testing to determine the expected long-term settlement and differential settlement of the fill. Please note: We consider that plate load tests do not confirm the expected long-term performance of the ground.
  - c) Allowable bearing pressures, expected settlement and differential settlement.
  - d) Consideration of the effects of slag, burnt shale and expansive soils.
  - e) Consideration of self-weight settlement of the fill.
  - f) Collapse compression analysis in accordance with BRE IP5/97.
  - g) Details of any ground treatment (e.g. vibro treatment, cement-lime stabilisation etc.).
5. Geotechnical validation report including:
  - a) Confirmation that all made ground and organic matter was removed.
  - b) Details of formation levels prior to filling works.
  - c) Depths of all cut and fill carried out across the site with levels linked to the original site investigation.
  - d) Details demonstrating compliance with Clause 610 of the Specification for Highway Works (for structural fills).
  - e) Details and locations of all tests and interpretation by the Geotechnical Engineer.
  - f) Confirmation of the bearing capacity achieved by the earthworks and confirmation that long-term settlement will not exceed 25 mm or 1:500 differential settlement.

If there are queries with regard to anything not covered within this document and/or it is intended to deviate from the above guidance, then please contact the Warranty Engineers for agreement prior to commencement. Following acceptance of the proposals, if anything is subsequently discovered on site, which affects the design and/or construction, please contact the Warranty Surveyor immediately.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

## 7. Important updates to the vibratory ground improvement section

We have made a number of **important updates** to our vibratory ground improvement section. The updates include guidance on what additional information we require where vibro ground improvements are specified, guidance on unsuitable ground conditions, what factors may increase the complexity of the works, foundation requirements, guidance on fill materials, and information regarding testing and validation.

It is well worth having a read through the new guidance to familiarise yourself with what's new. The updates can be found in section 3.5.

## 8. New 'Provision of information' for trees and clay

We have added a fourth 'Provision of information' in section 3.6. This notes that a detailed foundation design with reference to trees and the site specific site investigation report should be made available to the Warranty provider and all other interested parties prior to the associated works starting on site. The new note is as follows:

4. Detailed foundation design with reference to trees which are present, recently removed and newly planted and the site specific site investigation report.

## 9. New table regarding the positioning of heave precaution in various situations

In section 3.6.2, we have added the following table, which explains where heave precautions should be used.

**Table 2: Position of heave precaution in various situations**

Situation	Position of heave precaution
External mass fill and pier foundations <sup>(1)</sup>	Inside faces of external wall foundation that are greater than 1.5m in depth <sup>(2)</sup> All faces of pier foundations that are greater than 1.5m in depth <sup>(2)</sup>
Internal mass fill foundations <sup>(1)</sup>	None required
External wall ground beams for pier or piled foundations	Inside face and underside to all external ground beams
Internal ground beams for pier or piled foundations	Underside of all internal ground beams
Piled raft foundations	Underside of all piled raft foundations

## 10. Updated guidance regarding changes in ground level near trees

In 3.6.6, we have updated our changes in level guidance. We now provide 6 different scenarios, each containing guidance on how to calculate minimum foundation depths. The different scenarios vary depending on if trees are being removed, kept, or proposed, and if the ground level is raised or reduced.

We have also added two new details to supplement this guidance, showing where measurements should be taken from where the original ground level is raised or where the original ground level is being reduced.

Take a look at the new guidance in section 3.6.6 for more information.



# Ground Floors

## 1. Reduced the number of sub-sections

We have combined the current sections 4.1 (Suspended Beam and Block), 4.3 (Suspended Slab), and 4.5 (Suspended Timber), into a new section 4.1 'Suspended Ground Floors'. We have also combined our requirements for stepped floors, screeds, and underfloor heating into one section. As a result, the sub-section numbers for this section have changed.

The changes can be seen below:

### Old sub-sections

- 4.1 Suspended Beam and Block
- 4.2 Ground Supported Slab
- 4.3 Suspended Slab
- 4.4 General Requirements for Concrete Floors
- 4.5 Suspended Timber



### New sub-sections

- 4.1 Suspended Ground Floors
- 4.2 Ground Supported Slab
- 4.3 Stepped Floors, Screeds and Under Floor Heating Requirements

## 2. New guidance for proprietary suspended pre-cast insulated concrete floor systems

In the new section 4.1.1, we have new guidance for proprietary suspended pre-cast insulated concrete floor systems. The new guidance states that where proprietary suspended pre-cast insulated concrete floor systems are proposed, they must be designed by an Engineer with loads calculated in accordance with BS EN 1991-1-1, have a third party product approval certificate for its use, and, where gas membranes are required, the gas membrane must have a third party product approval certificate for use with the proposed floor system.

## 3. New guidance for sub-floor ventilation requirements

We have added new guidance to the new section 4.1.3, explaining our sub-floor ventilation requirements. This update includes that air bricks must be at least 75mm above the external ground level. It also notes the minimum ventilation voids and more, so be sure to have a look at the updates.

## 4. New table for the minimum thicknesses of structural floor boards in 4.1.7

In the previous section 4.5.5, we had a couple of tables that explain the minimum thicknesses and support centres for different kinds of structural floor boarding. We have now combined these tables into one, easy to read table, which explains the different minimum thicknesses for softwood floor boarding, particle board (chipboard), OSB, and plywood boarding.

The new table, found in the new section 4.1.7, is shown below:

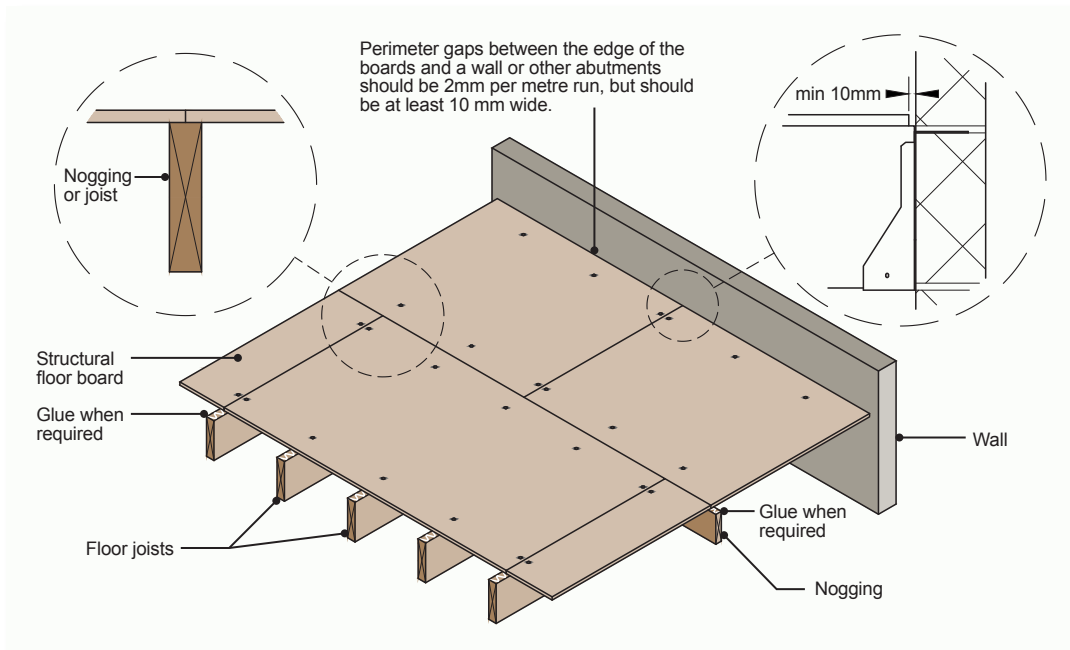
Structural floor boards should be specified in accordance with the below table<sup>1</sup>.

Structural floor board type	400mm joist centres	450mm joist centres	600mm joist centres
Softwood floor boarding	16mm	16mm	19mm
Particle board (chipboard)	18mm	18mm	22mm
Oriented strand board (OSB)	15mm	15mm	18mm/19mm
Plywood boarding	15mm	15mm	18mm/19mm

1. This table applies to normal domestic loads (imposed loads of 1.5 kN/m<sup>2</sup>).

## 5. Updated detail for typical floor board arrangements in 4.1.7

In the previous section 4.5.5, we had guidance on structural floor boarding for suspended timber floors. We have updated the detail (now titled 'Typical floor board arrangement') so that it shows more relevant information, and moved it to the new section 4.1.7.



## 6. Guidance for stepped party walls between 150mm and 600mm added

In the new 4.3.1, we have added guidance on stepped party walls between 150mm and 600mm. The new guidance reads as follows:

For our Warranty provision, where a Grade 3 performance is required, a combined system of waterproofing protection must be provided.

However; in the following specific circumstances only, a single form of waterproofing protection where a Grade 3 performance is required, may be acceptable subject only to:

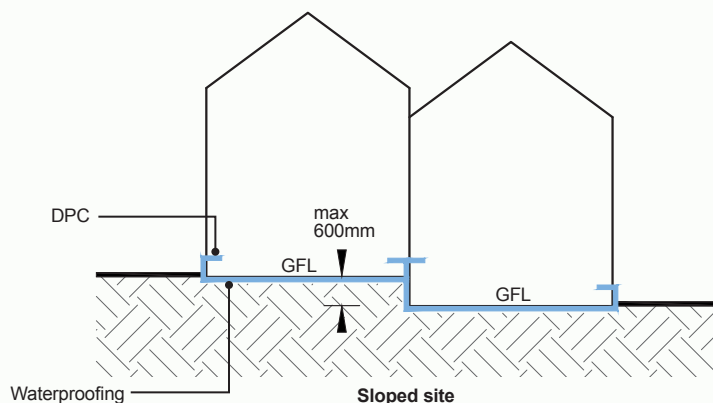
- On shallow stepped / gentle sloping sites where only part of the structure could result in retaining ground above the lowest finished floor level but in no situation greater than 600mm.
- And, the water table being proven to be permanently below the lowest floor level.

In these circumstances, the site conditions must be proven to not result in an unacceptably high risk and the consequences of failure are substantially low. This must be substantiated by a site investigation report and agreed with the Warranty provider before commencing work on site.

A site specific design proposal must be provided before commencement of construction on site, to demonstrate the proposed waterproofing solution (Type A, B or C) is appropriate for the ground conditions (based on the site investigation report). This will include for the wall and floor waterproofing proposals.

Any product proposed in such solutions must hold a suitable third party product conformity certification.

Such scenarios are limited to the above described and as shown in the below image.



# Drainage

## 1. New text for below ground drains that are laid on ground susceptible to movement

In section 5.3.1 we have added new guidance explaining what provisions must be in place when below ground drains are to be laid on ground that is susceptible to movement.

We also state that below ground drains should not be temporarily or permanently supported on bricks, block, or other hard materials.

The new guidance, which can be found under the 'General backfill' heading, is as below:

Below ground drains should not be supported on ground or fill that is susceptible to movement without adequate provision being made to:

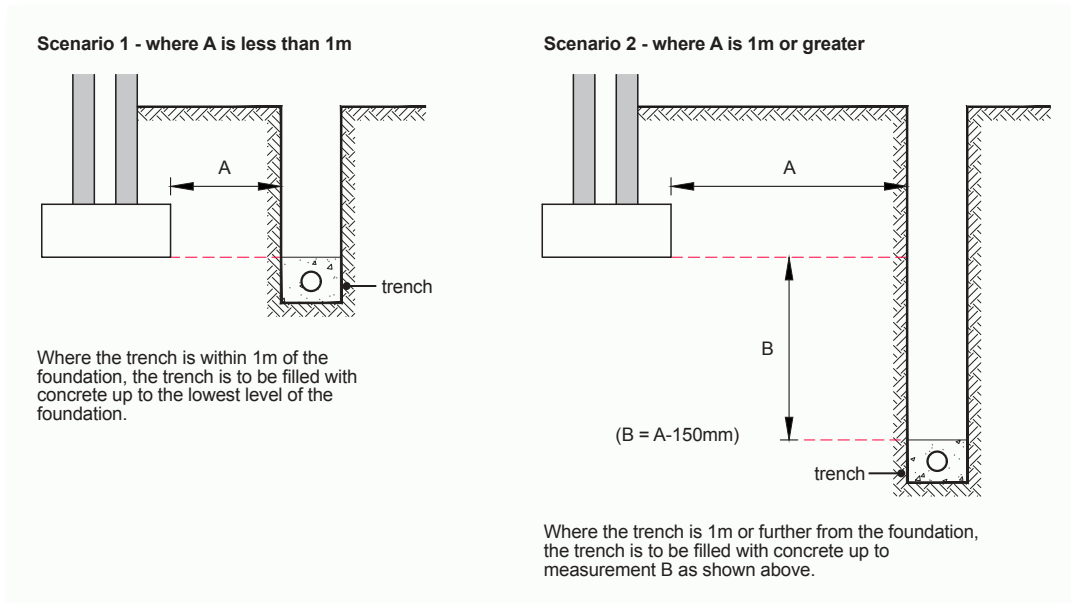
- Maintain minimum design gradients.
- Protect against backfall.
- Protect against leakage.

Bricks, blocks or other hard material should not be used as temporary or permanent supports for below ground drains.

## 2. Updated image for protecting pipes adjacent to foundations in 5.3.3

In the previous Technical Manual, we had an image called 'Drainage positions situated within angle of repose and adjacent to foundation by 1m'. We have now replaced that image with a new image titled 'Protecting pipes adjacent to foundations'.

This new image (shown below) provides examples of how you can protect pipes adjacent to foundations when they cannot practically be positioned so that they are not impacted by the loads of the foundation (as per Approved Document H).



# External Walls

## 1. New item added to the Limitations of Functional Requirements regarding means of escape, passive and active systems

We have added an additional item to the 'Limitations of Functional Requirements' list, stating that means of escape, passive and active systems **are not covered** by the Warranty. The new item is as below:

### Limitations of Functional Requirements

3. Means of escape, passive and active systems are not covered by the Warranty.

## 2. New Functional Requirement regarding meeting the design requirements of the Building Regulations

We have added a new Functional Requirement (number 1e) under the 'Design' heading, stating that 'External Walls shall be designed and constructed so that they meet the requirements of the Building Regulations'.

## 3. Alterations to the 'Suitable cavity wall construction depending on exposure, for use with full fill cavity insulation' table in 6.1.1

We have made the following changes to the 'Suitable cavity wall construction depending on exposure, for use with full fill cavity insulation' table in section 6.1.1:

1. We now accept full fill insulation in a very severe exposure zone with fair face masonry if the cavity width is at least 150mm and the third party accreditation confirms it can be used in this scenario. Previously fair faced masonry with full fill insulation in very severe exposure zones was not permitted.
2. For very severe exposure zones, where fair faced masonry with impervious cladding to all walls above ground storey is specified, we previously asked for at least 100mm cavity width for retro-fill insulation. We now ask for 125mm.

See section 6.1.1 of the new Technical Manual for a better look.

## 4. New text explaining when recessed mortar joints should not be used

In section 6.1.2, we have added the following new guidance which explains when recessed mortar joints should not be used:

Recessed mortar joints should be avoided where:

- Bricks are not frost resistant unless the brick manufacturer has confirmed their use for that particular location.
- The development is on steep sloping ground, facing open countryside or within 8km of a coast or large estuary.
- Bricks are perforated closer than 15mm to the face.
- There is no reasonable shelter from driving rain, e.g. from buildings or groups of trees within 50m and of similar height to the home.
- The cavity is to be fully filled with cavity insulation.

## 5. Additional guidance provided for horizontal movement joints and shelf angles

In section 6.1.6 we have guidance explaining our requirements regarding movement joints. We have added the following note to the end of this guidance regarding the use of shelf angles:

Note: Where traditional cavity masonry walls or masonry cladding is specified for concrete/(hot rolled) steel framed buildings, horizontal movement joints should be provided with the use of shelf angles at vertical centres in accordance with current design standards. They should be capable of accommodating at least 1mm movement per continuous meter of vertical clay masonry. Shelf angles should not be fixed back to a timber framed or LGSF structures. Please refer to the 'External Walls – Timber Frame' or 'External Walls – Light Gauge Steel Frame' sections for further guidance on accommodating differential movement.

## 6. Additional note added regarding our cavity tray requirements

In section 6.1.9, under the 'Cavity trays' heading, we have added an additional note stating that cavity trays must rise 150mm from the outer leaf to the inner leaf, that they must be self supporting or fully supported, and that their joints must be lapped and sealed.

## 7. Updated guidance for lateral restraint of walls at floor and roof level

We have made a number of amendments to section 6.1.11 and 6.1.12 regarding the lateral restraint of walls at floor and roof level. These changes bring our guidance in line with the requirements within BS8103-1 and PD6697. Be sure to have a look at the new guidance and familiarise yourself with the changes.

## 8. New note regarding the durability of bricks used for architectural detailing

We have added a new note in section 6.1.13 and 6.2.18 under the 'Corbelling and architectural brick detailing' heading, stating that where architectural brick detailing is specified, the brick manufacturer should confirm the expected durability of the product in the proposed use will meet our **Warranty service life requirement of 60 years**.

## 9. New guidance added for gable spandrel panels

We have added guidance in section 6.1.15 and 6.1.16 for gable spandrel panels. The new guidance covers drainage and ventilation, wall tie locations, fire spread and lateral restraint. There's also a number of new details, so be sure to have a look at the new pages.

### Introduction

Gable spandrel panels can be used as a continuation of the internal skin of masonry cavity blockwork.

The panels must be designed to resist wind loadings acting on the end walls and also loads applied by the claddings.

It is important that all spandrel panels, supporting structures and fixings, are designed by an Engineer to withstand all applied vertical and horizontal loads, on a site by site basis and not a generic solution.

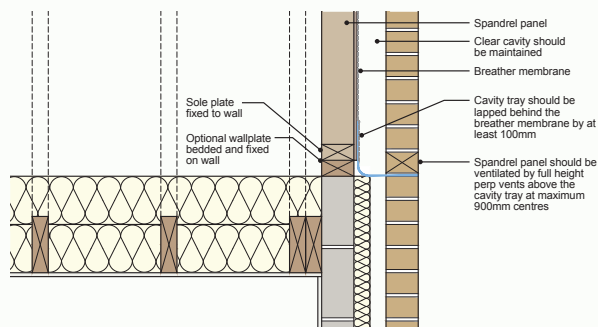
### Providing a drained and vented cavity

Gable spandrel panels must incorporate a sheathing board, breather membrane and maintain a minimum of a 50mm clear cavity. Full fill cavity insulation with not be acceptable for Warranty as this prevents the spandrel panel frame from being able to dry out. The stud positions should be clearly marked on the breather membrane to assist in correct installation and positioning of wall ties.

Where blown full fill insulation is being used in the masonry cavity wall, there should be a way of ensuring:

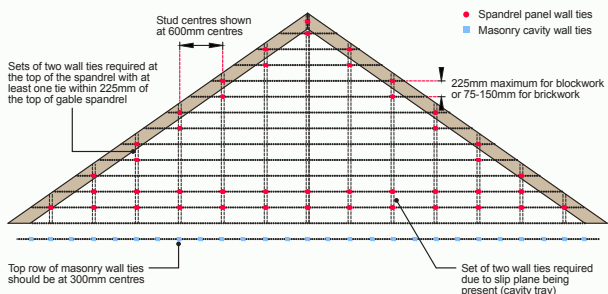
- The insulation does not deform the cavity tray at the base of the spandrel panel.
- The insulation does not spread into the spandrel panel cavity frame area.

This may be achieved by incorporating a non-deformable cavity closure or a rigid preformed cavity tray.



### Wall tie locations

Wall ties between the spandrel panel and brick or block outer leaf should have the ties fixed into the timber vertical studs of the spandrel panel. The spacing of wall ties should be increased at the top of the wall and where a potential slip plane is present (horizontal cavity trays at the base of the spandrel panel).



### Notes:

- For the general spandrel panel area, wall ties should be at every stud centre and at 450mm max vertical centres.
- The stud positions should be clearly marked on the breather membrane to assist in correct installation of wall ties.
- Block coursing shown in the above image. Wall tie spacings to be determined by the Engineer.

### Fire considerations

Fire spread from gable end spandrel panels is dependent on a number of factors and its distance from relevant boundaries. Advice should be sought from your Building Control Body for further information.

Where the gable spandrel panel provides support for the roof structure, there may need to be consideration for fire resistance, further information should be sought from the Building Control Body.

## 10. Reworded guidance on open and closed timber frame panels

In section 6.2.1, we have reworded our guidance on open and closed timber framed panels so that it is easier to understand. The new wording is as follows:

Factory assembled timber frame panels for the purposes of Warranty, can be categorized as either open panel or closed panel.

### Open panel systems

Open panel systems for the purposes of Warranty includes the following elements:

- External breather membrane and sheathing board,
- Insulation internally between the studs, and,
- A transparent Vapour Control Layer (VCL) which is left unfixed in order that the connections between panels can be viewed upon inspection.

Open panel systems must satisfy the guidance within this section.

### Closed panel systems

Closed panel timber frame systems, for the purposes of Warranty includes the following elements:

- With or without external cladding (external claddings for timber frame panels must have a drained and vented cavity as outlined within this section),
- External breather membrane and sheathing board,
- Insulation internally between the studs,
- A non-transparent vapour control layer secured over the inside face of the panel,
- Plasterboard inner finish installed.

Closed panel timber frame systems should be assessed and accepted by the Warranty Innovations Team prior to manufacture and before a Warranty quote applied for.

## 11. Altered guidance for SIP construction in 6.2.1

We have altered what we say in section 6.2.1 regarding SIP construction. Previously we stated 'Structurally Insulated Panels (SIPs) are a form of stressed skin composite panel. Only systems with independent third-party certification will meet the Warranty requirements'. We now say:

Where SIP's are specified, some of the requirements for a timber framed building found within this section will apply (such as breather membrane, VCL and ventilation requirements). However SIP's will also have more enhanced requirements such as the need for independent third party accreditation (this does not include evidence of a quality assurance system). Please refer to Appendix C for further guidance on SIP's.

## 12. Updated 'Provision of information' for timber frame external walls

In 6.2.1, we have updated one of our 'Provision of information' points. The point previously stated that "Details of the manufacturers relevant accreditation (BM TRADA, STA, etc). The accreditation must confirm the manufacturer has been assessed for the design of panels (not just joists or trusses).".

The updated point is as follows, with the changes highlighted:

1. Details of the manufacturer's relevant accreditation (BM TRADA, STA, etc.). The accreditation must **cover design, manufacturing and erection of the timber frame panels** (not just for joists or trusses).

### 13. New guidance for where timber framed panels are not accredited

In 6.2.1, we have added additional guidance for where timber framed panels **are not** accredited. The new guidance can be found under the 'Quality assurance systems' heading, and is as follows:

- The following must be satisfied where timber framed panels do not have a quality assurance system in place (max 5 plots per project):
  - Provide full structural calculations for each house type to Eurocode 5 (BS EN 1995-1-1).
  - Designs to account for any fixed non-timber components (e.g. sheathing boards), which may impact on the stability if shrinkage of the frame is not accounted for.
  - An independent third party Engineer must inspect each plot once erected and prior to any closing up. They must then provide a sign-off sheet at completion for the waterproof envelope confirming the timber frame construction meets the Eurocode as-built.

### 14. New point stating that an independent Engineer must monitor the design, installation, and completion of a one-off site assembled timber frame

In 6.2.1, under the 'Bespoke site assembled timber frame' heading, we have added a further point which explains that an independent Engineer **must** monitor the design, installation, erection and completion of any one off site assembled timber frames. They must also provide a sign off statement at completion. The new point is as below:

- Ensure an independent Engineer (not the design Engineer) monitors the design, installation, erection and completion of the timber frame system and provide a sign off statement at completion of the waterproof shell confirming that the timber frame construction has been installed:
  - In accordance with the design and fixing specification.
  - In accordance with the structural calculations.
  - With all structural timbers appropriately preservative treated in accordance with BS 8417.

### 15. Timber frames, sole plates and/or bottom rails must not be used below external ground levels or in a basement storey

We have added a new note in section 6.2.3, under the 'Key points: Construction below DPC' heading, stating 'The timber frame, sole plate and/or bottom rail **must not** be used below external ground levels or in a basement storey.'

### 16. New guidance for horizontal cavity barriers at intermediate floor level on a timber frame

In section 6.2.3, under the 'Drainage and ventilation' heading, we now provide guidance on where horizontal cavity barriers are used in timber frame construction. The new guidance states:

Where a horizontal cavity barrier is specified at intermediate floor levels, cavity trays and proprietary open perpend must be specified to maintain cavity drainage and ventilation above the cavity barrier.

### 17. Further note added regarding sole plates and level access provisions

In 6.2.5, under the 'Sole plates' heading, we've added a note stipulating that for guidance on level access provisions, the reader should look at our 'Driveways and Paving' section. We also mention that infinity patio type scenarios are not acceptable for Warranty unless suitable drainage provision acceptable to us is provided between the external wall and the ground finishes.

## 18. New sole plate tolerances for 140mm wide timber frame systems and updated sole plate tolerances for 89mm wide timber frame systems

In section 6.2.5 we have added new sole plate tolerances for timber frame systems that are 140mm wide. We have also updated our tolerances for standard 89mm wide timber frame systems. The guidance is now as follows:

Sole plates should:

- Not overhang or be set back from the substructure by more than 12mm on a 89mm sole plate and 20mm for a 140mm sole plate. Ledges formed by the frame being set back from the supporting base should be protected from moisture by a membrane.

## 19. Amended guidance on breather membranes

We have made a number of amendments to our guidance on breather membranes in section 6.2.7 and 6.3.4 to bring it up to date. These changes can be seen highlighted below:

Breather membranes should:

- Have appropriate third party product approval.
- Have a vapour resistant to less than 0.6MNs/g (0.12 Sd) when tested in accordance with BS EN ISO 12572 using the set of conditions C and using five test specimens.
- Be a minimum Class W2 or better in accordance with BS EN 13859-2.
- Be a minimum Class W1 in areas of very severe exposure, where liquid water penetration of the cladding is anticipated or where the membrane is likely to be left exposed during construction.
- Be capable of resisting water penetration.
- Be durable to resist site damage when wet.
- Be self-extinguishing.
- Be securely fixed to protect the outside face of the timber frame structure with austenitic stainless steel staples.
- Be placed on the outside of the timber structure and any external insulation adjacent to the external wall cavity.
- Be trimmed to leave 25mm lap below the lowest timber sole plate.
- Be repaired if damaged.
- Have the location of solid timber studs clearly marked on the outer face of the breather membrane to ensure that cladding fixings are installed into solid timber.

Breather membranes should be lapped by a minimum of 100mm at horizontal joints, and a minimum of 150mm at vertical joints. Vertical joints should be staggered at regular intervals where possible. The breather membrane should be lapped to deflect moisture away from the timber frame structure (upper layers over lower layers).

Breather membranes should be fixed using austenitic stainless-steel staple nails at the following centres:

- Horizontal
  - Panel centres - 600mm max.
  - Horizontal membrane joint - 150mm.
  - Head and base of panels - 150mm.
- Vertical
  - 300mm centres vertically (may be increased to a maximum of 500mm when verified with third party certification).
  - Vertical membrane joint - 150mm.
  - Ends of panel - 150mm.
- Around openings - 150mm.

If breather membranes are trimmed flush with the edges of wall panels, additional strips of breather membrane, at least 300mm wide, should be supplied and site fixed over panel junctions.

## 20. New note regarding differential movement guidance for lift shafts and stairwells of mixed construction, and steel posts

In section 6.2.15, we now state that lift shafts and stairwells of mixed construction, and steel posts will require site specific calculations to work out the anticipated differential movement with the timber frame.



## 21. Updated 'Provision of information' for light gauge steel frame certification

In the previous Technical Manual, in section 6.3.1, we had a 'Provision of information' which stated that a full set of design drawings and specifications shall be made available to the Warranty Provider, which may include evidence of SCI stage 1 and 2 certification. We have now added to this, noting that it may include evidence of SCI stage 1 or 2 certification OR evidence of a third party system approval (UKAS or equivalent) for the system and has been assessed by our Warranty Innovations Team.

## 22. New guidance for light gauge steel frame and FPC certification requirements

In section 6.3.1, under the 'General requirements' heading, we now state that manufacturers of structural, load bearing light gauge steel systems should hold certified FPC in accordance with BS EN 1090 to comply with Construction Products Regulations.

## 23. New note on level access arrangements

In section 6.3.1 we have a new note, under the 'General detailing and specification' heading, which states that 'Level access arrangements should be kept to a minimum and no more than 15% of the external perimeter of an individual building (e.g. a single plot in a row of terraced homes).'

## 24. New 'Provision of information' regarding the specification of render

In the 'Provision of information' for section 6.4.1, we have added new text regarding the specification of pre-bagged and site made render. The new text stipulates that details of the render thickness should be provided in accordance with the exposure zone. The specification should also identify the measures proposed to control movement within the back ground substrate and clearly identify the provision of movement joints and any additional reinforcements.

## 25. Updated guidance for render directly applied to ICF structures

In the previous Technical Manual, we stated that generally, for Warranty purposes, a render directly applied to an ICF structure to provide a weather resistant cladding will not be acceptable, **except** in certain situations.

We have updated this guidance, which can be found in section 6.4.6, to now state that for Warranty purposes, a render directly applied to an ICF structure to provide a weather resistant cladding **will not be acceptable**.

## 26. Updates to the 'Provision of information' for section 6.5.1

In section 6.5.1 for 'External Walls - Claddings' we have updated a number of the 'Provision of information' points. We have updated the third point to now include wind load calculations. The fourth point has been updated to also say 'Site specific structural calculations of the brackets and fixings for the project are to be provided for the curtain wall or cladding system'. Finally, the sixth point has been amended to now also request information about test data of cavity barriers. The amendments can be seen highlighted below:

1. Full set of drawings including locations of curtain walling and cladding applications for each elevation and section details showing the external wall makeup.
2. Façade specification and/or full manufacturer's specification.
3. Manufacturer, Engineer or façade contractor must provide site specific **wind load calculation for the façade of the building**, structural calculations of the curtain wall or cladding system for the project and specified design loads (live and dead load).
4. Bracket and fixing specification for the cladding system including the fixing type, size, spacing and method of fixing to the substrate. **Site specific structural calculations of the brackets and fixings for the project are to be provided for the curtain wall or cladding system**. Details of corrosion protection and how bi-metallic corrosion is to be mitigated should also be provided.
5. Details of any technical assessment (third party product conformity certificates) and/or test data.
6. Details of proposed cavity barriers to be used including materials, period of fire resistance (in compliance with the project fire strategy), **test data for the system including any test data of penetrations through a barrier (e.g. brick shelf support angle brackets)**, **plans and elevations detailing the locations of the barriers in the façade** and vertical and horizontal section details at all interfaces.
7. Details of proposed on site testing regimes.

## 27. New note regarding considerations for a 'chimney effect' in curtain walls

In section 6.5.1, under the 'Curtain walling' heading, we discuss how considerations must be given to structure-borne sound in curtain walling. We now also state that considerations must also be made for the chimney effect allowing hot smoke or fire bypassing the slab edge fire barrier in a fire situation. Any fire stopping product should be tested to BS EN 1364-4 for fire stop testing in curtain walls and CWCT TN 98.

## 28. Amended guidance regarding curtain wall testing

We have made some amendments to our guidance regarding the testing of curtain wall systems in section 6.5.2. The amendments can be seen highlighted below:

The curtain wall system will have either been:

- Tested and provided with a classification given in BS EN 13830, or
- If the curtain walling is of a custom design, it should be tested to an appropriate standard of CWCT sequence A or B testing **when tested at a test pressure of at least 600 pascals** by an independent UKAS accredited test facility to ensure that the system meets or exceeds the weather performance classification for the building taking into account the design parameters and project location.

**Note:** At a test pressure of 600 pascals, an air infiltration rate no higher than 1.5m<sup>3</sup>/hr/m<sup>2</sup> for fixed glazed panels is permissible.

## 29. New guidance for rainscreen cladding systems

We have added a number of new points to our guidance in section 6.5.2 regarding rainscreen cladding systems.

- We have added a note stating that 'Where insulation is fixed to a backing wall, a minimum of one non-combustible fixing per 1m<sup>2</sup> or per insulation batt (whichever is the lesser) should be provided in addition to the other fixings.'. This aligns us with standard guidance throughout the industry. This guidance has also been added to 6.5.5.
- We have added a note regarding pressure moderation, stating that 'Cavities should be closed within 300mm of corners to reduce the effect of wind pressure in line with clause 2.2.6.1 of the CWCT Standard for Systemised Building Envelopes.
- We have added that cavity barriers should be present around openings.
- We state that open state cavity barriers are not suitable for vertical arrangements.
- For sheathing boards, we have added that 'Joints between the boards must be sealed and interfaces between the external sheathing board and the structure must have adequate sealing to ensure the wall is weathertight'.
- For sheathing boards we also state that 'Movement must be accommodated in the sheathing board and breather membrane at floor level'.

As there have been a number of changes to this section, make sure you have a glance at the new Technical Manual to familiarise yourself with the changes.

## 30. New note regarding finishes applied to timber boarding in 6.5.3

In section 6.5.3 we have added new guidance regarding the application of finishes to timber boarding. The new guidance states that finishes applied to timber boarding should be a translucent or opaque penetrating vapour permeable stain or paint rather than a film coating type e.g. oil-based paint or varnish.

### 31. New set of 'Provision of information' points for timber and tile claddings

We have now included a 'Provision of information' for timber and tile claddings in section 6.5.3. They are as follows:

A full set of design drawings and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

1. Full set of drawings including locations of timber and tile cladding applications for each elevation and section details showing the external wall makeup.
2. Fixing specification for the cladding system including the fixing type, size, spacing and method of fixing to the substrate.
3. Where timber cladding/boarding is proposed, a specification of the timber to be used should be provided to confirm it has a minimum service life of at least 15 years. Details of preservative treatment used (if any) to BS8417 should also be provided.
4. Details of proposed cavity barriers to be used including materials, period of fire resistance (in compliance with the project fire strategy), locations and vertical and horizontal design details at all interfaces.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

### 32. New set of 'Provision of information' points for brickslips and brickslip systems

We have now included a 'Provision of information' for brickslips and brickslip systems in section 6.5.4. They are as follows:

A full set of design drawings and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

1. Full set of drawings including locations of where brickslips and brickslip systems are to be used for each elevation and section details showing the external wall makeup.
2. Detailed specification of all materials to be used within the brickslip system build-up.
3. Details of material specification for the brick slips with evidence the brick slips satisfy the requirements of BS EN 771.
4. Third party product conformity certificates for brickslip systems.
5. Details of proposed cavity barriers to be used including materials, period of fire resistance (in compliance with the project fire strategy), locations and vertical and horizontal design details at all interfaces.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

### 33. Updated guidance for brick slips on ICF structures in 6.5.4

In section 6.5.4, we have updated guidance on where brick slips are specified for ICF. The new guidance states they must be part of a system with appropriate third party certification which confirms the weather resistance of the cladding. The new guidance also states a drained and vented cavity must be provided, the fixing specification must be as per the certification requirements and must be fixed back to the concrete core. The new guidance also states that cavity barriers must be appropriately selected.

Be sure to have a look in the new section 6.5.4 to familiarise yourself with the updates.

### 34. We now state that brickslips require saturation/freeze/thaw testing

In section 6.5.4, under the 'Installation on different substrates - Masonry cavity wall' heading, we now say that the design and fixing of the slip system must be in strict accordance with the third party product conformity certificate with any adhesion tests, pull out tests **and saturation/freeze/thaw testing** completed satisfactorily as per the requirements of the certificate.

### **35. New notes regarding brickslip cladding on framed construction with a backing board or as a rainscreen cladding system**

We have added two new notes to our guidance for brickslip cladding on framed construction with a backing board or as a rainscreen cladding system in section 6.5.4. The two new notes are as follows:

- The design and fixing of the slip system must be in strict accordance with the third-party product conformity certificate with any adhesion tests, pull out tests and saturation/ freeze/thaw testing completed satisfactorily as per the requirements of the certificate.
- Cavity barriers behind the brick slips or rainscreen system must be appropriately selected, suitable for use and be aligned with the compartment wall and floor and be provided around openings.

### **36. New requirement for horizontal rail support for EWI**

In section 6.5.5, under the 'Fixing requirements' heading, we note that insulation boards should be fixed in accordance with the manufacturers requirements. We now also state that where the support of the system is via a horizontal rail system, calculations to demonstrate the system can withstand the design load are required.

We also say that a minimum of one non-combustible fixing per 1m<sup>2</sup> or per insulation batt, whichever provides the greater number, should be provided in addition to the other fixings.

### **37. New set of 'Provision of information' points for stone cladding**

We have now included a 'Provision of information' for stone cladding in section 6.5.7. They are as follows:

A full set of design drawings and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

1. Full set of drawings including locations of stone cladding applications for each elevation and section details showing the external wall makeup.
2. Details of material specification for the stone cladding with evidence the stone cladding satisfy the requirements of BS EN 771-6 (e.g. Declaration of Performance document).
3. A statement from the supplier confirming the selected stone units are freeze/thaw resistant. Please note, the units must be selected based on the performance of the actual sourced product and not a generic one.
4. Details of proposed cavity barriers to be used including materials, period of fire resistance (in compliance with the project fire strategy), locations and vertical and horizontal design details at all interfaces.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

### **38. New note regarding the acceptability of insulation products with stone cladding**

In section 6.5.7, under the heading 'Insulation (applicable to masonry cavity walls only)', we have guidance regarding where full fill cavity insulation can be considered. We have now added what accreditation/information will be required when this is specified.

Full fill cavity insulation should only be considered where the outer leaf is backed by brick/blockwork, although this is still dependent on exposure, i.e. either partial fill, leaving a residual cavity of 50mm, or a clear cavity should always be the preferred options. Full third party accreditation, BS8104 analysis, site specific designs, information on porosity of stone and strict acceptance from the manufacturer for any wall build-up will be required.

### 39. New guidance on what standards natural stone masonry should comply with and more detailed guidance for the use of natural stone masonry in relation to its durability and freeze/thaw requirements

In section 6.5.7, we had added what standards natural stone masonry should comply with. We now also have more detailed guidance for the use of natural stone masonry in relation to its durability and freeze/thaw requirements. We now stipulate:

Natural stone masonry should comply with the following:

- BS EN 771-6
- BS EN 1996
- PD 6697

Natural stone masonry must be selected by the designer, to be based on its suitability for:

- The specific cladding proposal design requirements.
- For the specific site exposure and orientation that the building / plot will be located – using that stone.

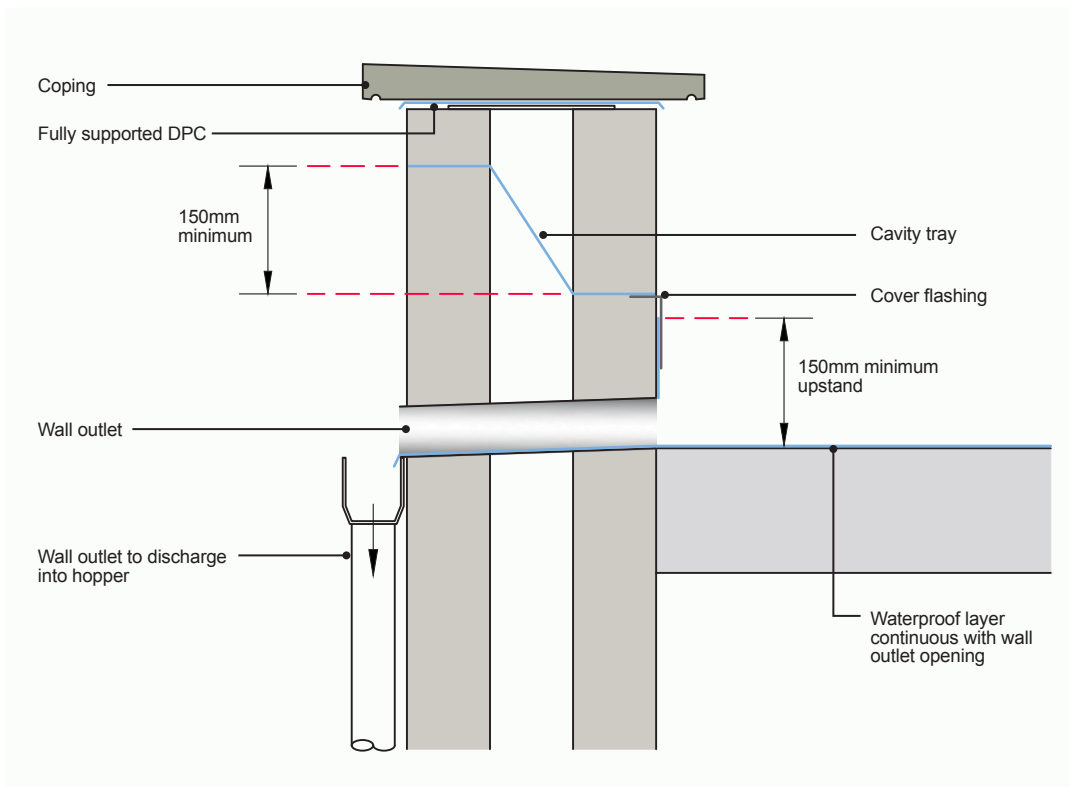
The Architect must ensure the units are selected based on the performance of the actual sourced product and not a generic one. BS EN 771-6 specifies the characteristics and performance requirements of masonry units manufactured from natural stone.

The selected stone performance information may be found in a Declaration of Performance document issued by the quarry supplier.

### 40. New guidance and detail for parapet wall chute detailing

We have added new guidance and a new detail, explaining our requirements for when a chute penetrates a parapet.

The new guidance can be found in section 6.6.7, so be sure to take a look. The new detail is as below:



# Internal Walls

## 1. References to 'fire doors' changed to 'fire doorsets'

In sections 7.1.2, 7.2.3 and 7.3.3 of the previous Technical Manual, we had a number of references to 'fire doors'. We have now changed these to say 'fire doorsets' as per the Approved Documents.

## 2. Simplified guidance for sound insulation

We have updated and simplified our guidance in sections 7.1.3, 7.2.4 and 7.3.4 for sound insulation in internal separating walls.

The previous guidance stated:

### Sound insulation

Internal separating walls shall, where necessary, have adequate resistance to the transmission of sound.

All separating walls in England and Wales may be built in accordance with Robust Details and meet the requirements for Resistance to the passage of sound in the relevant Building Regulations. Compliance with the relevant Building Regulations can be demonstrated by either:

#### Pre-completion testing

Pre-completion testing (PCT) is required in the following situations:

- To all new build properties (including rooms for residential purposes), other than when the Developer has registered and built in accordance with Robust Details.
- Where the sound insulation construction is in accordance with the guidance given in the relevant Building Regulations for resistance to the passage of sound.
- Where the building is not built in accordance with the relevant Building Regulations.
- The requirements of the Robust Details system have not been met.

or

#### Robust details

The use of robust details as a means of providing adequate sound insulation applies only to party walls and floors between different dwellings or flats. It is approved by Robust Details Ltd.

The robust design details are available in a handbook, which can be purchased from:

Robust Details Ltd, Unit 14, Shenley Pavilions, Chalkdell Drive, Shenley Wood, Milton Keynes, MK5 6LB  
Tel 0870 240 8210

[www.robustdetails.com](http://www.robustdetails.com)

Robust Details Ltd may undertake monitoring to check on the performance achieved in practice.

The simplified guidance now states:

Internal separating walls shall, where necessary, meet the requirements for the resistance of sound in the relevant Building Regulations. Compliance with the relevant Building Regulations can be demonstrated by either carrying out pre-completion testing or Robust details. For further information, advice should be sought from your Building Control Body.

## 3. Restructure of our guidance regarding plasterboard specification

We have restructured/reordered our guidance regarding plasterboard specification in both section 7.2.3 'Internal Walls - Timber Stud' and 7.3.3 'Internal Walls - Metal Stud', to improve the flow and readability of the guidance. Have a look at the new guidance to familiarise yourself with the new layout.

# External Windows and Doors

## 1. New guidance for water tightness in developments over 6 storeys

In section 8.1.1 we have provided new text, explaining our requirements regarding water tightness in developments over 6 storeys. The new text can be found in the introduction paragraph, and is as below:

For developments that are 6 storeys and above, the test pressure should be at least 25% of the design wind load for weathertightness. For further information, advise should be sought from our Major Projects Team.

Additional requirements of CWCT Technical Note 95 also apply for developments that are 6 storeys and above.

## 2. 'Stacked Windows' section renamed to 'Additional Requirements for Vertically Stacked Coupled Window Assemblies'

We have renamed our existing section 8.5 to 'Additional Requirements for Vertically Stacked Coupled Window Assemblies', to better reflect the type of window system we are referring to in the guidance.

## 3. Amended and new guidance in 8.5, including updated testing requirements, structural integrity, accommodating movement, and more

Along with the change in name, we have also made a number of changes to the guidance contained within 8.5.

We have updated our testing requirements, which we have split up into two categories; on-site testing and off-site testing requirements.

We have new guidance on dual sealed coupling joints, which explains what should be included as part of the joint, along with a number of other requirements.

Our new guidance on structural integrity covers design requirements, requirements regarding wind loadings, guidance surrounding loadings, and more.

We have added new guidance explaining how gaps around the windows may need to be larger than that of regular windows to accommodate any anticipated movement between the window and the surrounding wall construction, and further requirements regarding movement.

There's also further guidance surrounding sealing vertically stacked coupled windows, assembly over 5 storeys, and more. It is well worth having a read of the new section to familiarise yourself with the updated guidance.

# Stairs

## 1. New guidance for when glazed guarding is specified in and around a staircase

We have added new guidance to section 9.1.1, which explains our requirements for when glazed guarding is specified in and around a staircase. We state:

Where glazing is specified in and around a staircase, the glazing should either:

- If broken on impact, break in a way which is unlikely to cause injury; or
- Resist impact without injury; or
- Be shielded or protected from impact.

Where toughened glazing is specified, 100% of toughened glazing should be formed and then heat soak tested in accordance with BS EN 14179-1. The glass must be permanently marked in accordance with BS EN 14179-1 and substantiated evidence of heat soak testing must be disclosed for all effected panes.



# Upper Floors

## 1. Reduced the number of sub-sections

We have combined the current sections 10.4 (Floor Boarding for Timber Upper Floors) and 10.5 (Plaster Boarding for Timber Upper Floors) into a new section called 'General Requirements for Timber Upper Floors'.

As a result, the sub-section numbers for this section have changed slightly.

The changes can be seen highlighted below:

### Old sub-sections

- 10.1 Suspended Timber
- 10.2 I-joists
- 10.3 Metal Web
- 10.4 **Floor Boarding for Timber Upper Floors**
- 10.5 **Plaster Boarding for Timber Upper Floors**
- 10.6 Suspended Beam and Block
- 10.7 Concrete Plank
- 10.8 General Requirements for Concrete Upper Floors
- 10.9 **General Requirements - Cavity Barriers and Fire Stopping**



### New sub-sections

- 10.1 Suspended Timber
- 10.2 I-joists
- 10.3 Metal Web
- 10.4 **General Requirements for Timber Upper Floors**
- 10.5 Suspended Beam and Block
- 10.6 Concrete Plank
- 10.7 General Requirements for Concrete Upper Floors
- 10.8 Cavity Barriers and Fire Stopping

## 2. Moved guidance for lateral restraint

In the previous Technical Manual, we provided guidance on the lateral restraint of walls in both section 6 (External Walls) and section 10.

To try and make sure all of our guidance on the lateral restraint of walls is together, we have made the decision to move most of the guidance for lateral restraint to section 6.

This means some of the details and guidance currently found in section 10 will now be found in section 6.

We still provide brief notes regarding the lateral restraint of walls in sections 10.1, 10.2, 10.3, 10.5 and 10.6, which also re-directs people to section 6 for further information.

Below is an example of the note you will find throughout section 10:

### Lateral restraint of walls

Walls should be adequately restrained at floors, ceilings and verges in accordance with the relevant Building Regulations.

Restraint can be provided by:

- Lateral restraint straps.
- Restraint type joist hangers.
- Other forms of restraint proven by the Engineer.

Please refer to the 'External Walls' section for further guidance.

### 3. Simplified guidance for sound insulation

We have updated and simplified our guidance in the new section 10.4.1, 10.5.1 and 10.6.1 for sound insulation in internal separating walls (this was previously in 10.4.1, 10.6.2 and 10.7.2). The simplified guidance now states:

Internal separating floors shall, where necessary, meet the requirements for the resistance of sound in the relevant Building Regulations. Compliance with the relevant Building Regulations can be demonstrated by either carrying out pre-completion testing or Robust details. For further information, advice should be sought from your Building Control Body.

### 4. New table for the minimum thicknesses of structural floor boards in 10.4.1

In the existing section 10.4.1, we had a couple of tables that explain the minimum thicknesses and support centres for different kinds of structural floor boarding. We have now combined these tables into one easy to read table, which explains the different minimum thicknesses for softwood floor boarding, particle board (chipboard), OSB, and plywood boarding.

The new table is shown below:

**Minimum thickness for structural floor boards**

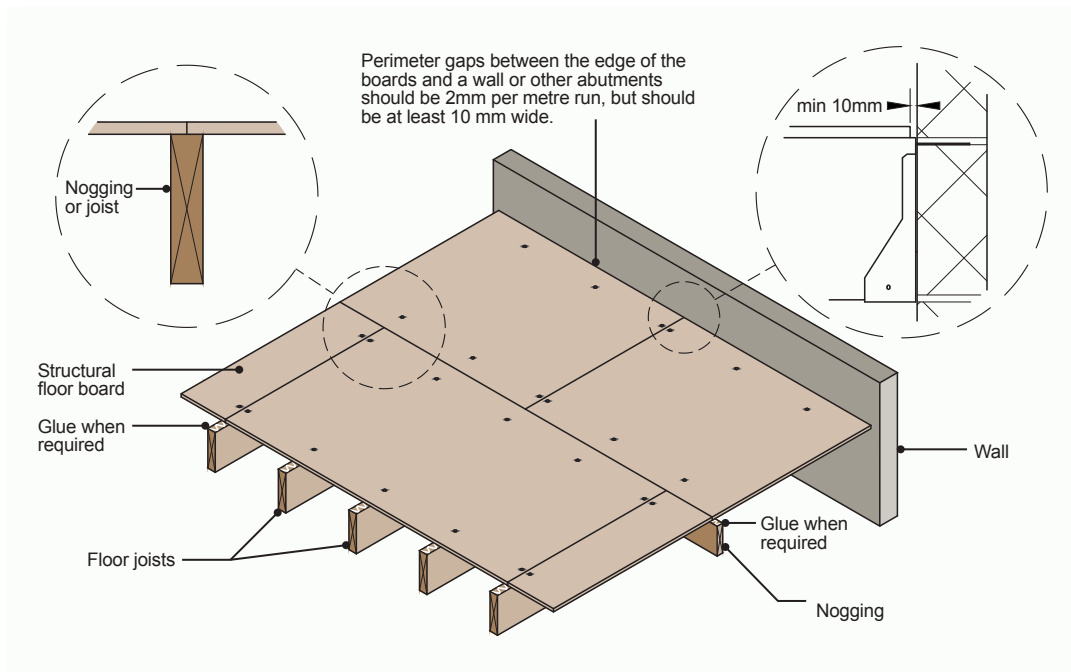
Structural floor boards should be specified in accordance with the below table<sup>1</sup>.

Structural floor board type	400mm joist centres	450mm joist centres	600mm joist centres
Softwood floor boarding	16mm	16mm	19mm
Particle board (chipboard)	18mm	18mm	22mm
Oriented strand board (OSB)	15mm	15mm	18mm/19mm
Plywood boarding	15mm	15mm	18mm/19mm

1. This table applies to normal domestic loads (imposed loads of 1.5 kN/m<sup>2</sup>).

### 5. Updated detail for typical floor board arrangements in 10.4.1

We have updated our detail (now titled 'Typical floor joist arrangement') in section 10.4.1 so that it shows more relevant information.



## 6. New general requirements for structural floor boarding in 10.4.1

We have some new guidance for where structural floor boards are specified. These can be found in section 10.4.1 and are as follows:

Where structural floor boards are specified, the following should be taken into account:

- They should be specified in accordance with the 'Minimum thickness for structural floor boards' table, guidance within this section and relevant British Standards.
- Fixings should be in accordance with the manufacturer's recommendations, where this is not provided, the guidance within this section or BS 8103-3 should be used.
- Where gluing is required, boards should be glued to the joists and between board joints, using a suitable polyvinyl acetate (PVAc) adhesive.
- Square edged boards should be supported on all edges by joists or noggings.
- Tongue and groove boards should be laid:
  - With long edges at right angles to joists.
  - So that short edges are supported on joists or noggings or they should be cut back to form a butt joint over a joist.
  - So that long edges at room perimeters are supported on a joist or noggings.
- Perimeter gaps between the edge of the boards and a wall or other abutments should be 2mm per metre run, but should be at least 10 mm wide.

## 7. New guidance for softwood boarding, plywood boarding, particle boarding, and OSB

In section 10.4.1, we have added some new guidance for when softwood floor boarding, plywood boarding, particle boarding (chipboard) or oriented strand boarding (OSB) has been specified. This guidance is to be read in conjunction with the new general requirements for structural floor boarding guidance (as above).

See the new guidance below, and go to section 10.4.1 for a better look.

### Softwood floor boarding

- Softwood floor boarding should be specified in accordance with BS EN 13353 and BS 1297
- Maximum moisture content at the time of fixing should be between 15%-19% (this may be reduced when installing in heated spaces, see BS 8103-3 for further details).
- All boards must be double nailed or secret nailed to each joist using nails that are at least three times the board depth.

### Particle board (chipboard) and oriented strand board (OSB)

- Particle board should be type P5 to BS EN 312 or OSB boards should be type 3 or 4 to BS EN 300.
- Maximum moisture content at the time of fixing should be 12%.
- Flat headed annular-ringed shank nails or screws should be used.
- All fixings should be a minimum of 50 mm or 2 times the thickness of the board, whichever is greater.
- The diameter of the fixing should be a minimum of 0.16 times the thickness of the board.
- Fastenings should be spaced at centres not more than 150 mm along both continuously supported edges and 300 mm along the intermediate supports.
- Fastenings should be at least 8 mm from the edge of the board.
- Nail heads should be punched 2-3mm below the surface of the board and screws should pre-drilled and countersunk.
- Fixings in service class 2 fixings should be corrosion resistant.
- A 3 mm gap should be left between each square edge boards.

### Plywood boarding

- Plywood boarding should be specified in accordance with BS EN 636.
- Maximum moisture content at the time of fixing should be 12%.
- Plywood boarding should be laid so that the grain within the face is at right angles to the supporting elements.
- Fixings should be spaced at a maximum of 150mm around the outer perimeter of the boards, with fixings a maximum of 300mm apart at intermediate supports.
- An expansion gap of a minimum of 2mm should be allowed between each panel.

# Roofs

## 1. New item added to the Limitations of Functional Requirements regarding means of escape, passive and active systems

We have added an additional item to the 'Limitations of Functional Requirements' list, stating that means of escape, passive and active systems **are not covered** by the Warranty. The new item is as below:

### Limitations of Functional Requirements

- 4. Means of escape, passive and active systems are not covered by the Warranty.

## 2. Previous sections 11.1 and 11.2 have been combined into one new section

The previous section 11.1, which was 'Roofs - Pitched - Pre-formed Truss', and the previous section 11.2, which was 'Roofs - Pitched - Traditional Cut', have been combined into one new section titled 'Roofs - Pitched Roof Structures'. We have done this because a lot of the guidance in the previous two sections was the same, and therefore we were able to reduce the length of the guidance to improve the usability.

## 3. New sub-section added for panelised roof cassettes

We have introduced new guidance on panelised roof cassettes, which explains our stance around third party product conformity certification, transitional arrangements, design requirements, storage and protection requirements, installation requirements, and more.

This guidance will form the new section 11.2, so be sure to have a look.

## 4. Previous sections 11.3, 11.4, and 11.5 have been combined into one new section

The previous sections 11.3, 11.4, and 11.5 provided guidance on concrete interlocking tiles, plain tiles, and slates. Similarly to the amendment above, we have now combined these sections into one new section 11.3, titled 'Roofs - Pitched Roof Coverings (Tiles and Slates)'. Again, this has been done to cut out repeat information, and therefore reduce the length of the guidance and improve the usability. Take a look at the new section 11.3 to familiarise yourself with the update.

## 5. New sub-section numbers throughout the section

As a result of the above amendments, the sub-section numbers throughout the section have been updated to the following:

### Old sub-sections

- 11.1 Pitched - Pre-formed Truss
- 11.2 Pitched - Traditional Cut
- 11.3 Concrete Interlocking Tiles
- 11.4 Plain Tiles
- 11.5 Slate
- 11.6 Flat Roofs
- 11.7 Green Roofs
- 11.8 Metal Deck Roofing
- 11.9 Blue Roofs
- 11.10 Podium Decks



### New sub-sections

- 11.1 Pitched Roof Structures
- 11.2 Panelised Roof Cassettes
- 11.3 Pitched Roof Coverings (Tiles and Slates)
- 11.4 Flat Roofs
- 11.5 Green Roofs
- 11.6 Metal Deck Roofing
- 11.7 Blue Roofs
- 11.8 Podium Decks

## 6. New 'Provision of information' notes for pre-formed trusses

We have added some additional points to the 'Provision of information' in section 11.1.1, covering third party product approval certificates for roof underlays and ventilation strategies.

The new notes are highlighted below:

1. Full details of the roof layout inclusive of the layout of trusses, any intersecting roof construction such as hips and valleys, details of girder trusses, multiple trusses and diminishing trusses, including how they are to be fixed together and supported on truss shoes, lay boards or all associated bracing requirements, details of restraint/holding-down strapping and fixings.
2. An Engineer's full set of structural calculations for the roof construction.
3. Details for any required trimming work around chimneys, formation of access hatches, details for the formation of supportive structure for equipment and access to equipment requiring periodic maintenance and inspection contained within the roof space, etc.
4. Waterproofing and flashing details around abutments, chimneys, service penetrations etc.
5. **Third party product approval certificate for the roof underlay.**
6. Detailed sections and material specification for all components to be used in the construction of the pitched roof including but not limited to, vapour control layers, breather membranes, insulation etc.
7. **Details of the ventilation strategy for the pitched roof in line with the guidance provided in this section and/or BS 55250.**
8. Details of all fire stopping which should include specification and a detailed location layout drawing showing positioning of all fire stopping.

## 7. Our guidance on handling and transportation, manual lifting, and mechanical lifting of roof trusses has been moved

In section 11.1.3 of the previous Technical Manual, we had guidance covering the handling and transportation, manual lifting, and mechanical lifting of roof trusses. This has now been moved to Appendix C.

## 8. New guidance added for when a LR underlay is used over a fully supported material that provides a high resistance to the passage of air and water vapour

In section 11.1.11, we have included new guidance for when an LR underlay is specified over a fully supported material that provides a high resistance to the passage of air and water vapour. In this situation, the LR underlay should be treated as a HR underlay. The new guidance also explains when an open jointed square edged sarking board can be treated as an unsupported LR underlay.

The new guidance can be found under the 'Vapour permeable (type LR) underlays' heading and is as follows:

Where a LR underlay is used over a fully supported material (plywood, OSB or chipboard for example) which provides a high resistance to the passage of air and water vapour, the LR underlay should be treated, for design purposes, as a HR underlay. Where open jointed square edged sarking boards are used, typically 150mm wide with a minimum of 2mm gaps between each board, they can for design purposes be treated as unsupported LR underlays.

## 9. New guidance explaining what permanent markings we expect to see on tiling battens

In the new section 11.3.2, we have added new guidance which lists what permanent markings we expect to see on tiling battens. Each batten should be permanently marked with the supplier name, the origin (imported or British grown, and/or the species code), that it's graded to BS5534, and it's size.

## 10. New table included in 11.3.5 for gauge, headlap, and permissible roof pitch for different roof coverings

In the new section 11.3.5, we have added a table with shows our gauge requirements, minimum headlaps, and our minimum permissible roof pitches for different types of roof coverings (concrete interlocking tiles, plain tiles, and slates). We have introduced this new guidance following a review of BS5534 and the latest industry practices. The new table is as follows:

Type of tile or slate	Gauge	Minimum headlap	Minimum permissible pitch
Concrete interlocking (single lap)	As per manufacturers recommendations	75mm or to the manufacturer's recommendations	30° <sup>(2)</sup>
Plain (double lap)	Plain (double lap)	65mm generally for clay tiles 75mm in severe exposure conditions	35°
Slates (double lap)	Maximum 1/3 length lap	54mm <sup>(1)</sup> minimum, increased with lower pitch and severe exposure conditions	20° subject to headlap
Notes: 1. For pitches greater than 45° in sheltered and moderate exposure zones only. 2. For pitches below 30°, evidence shall be provided as to suitable performance. The roof pitch should not be less than 20°.			

## 11. New guidance in 11.3.6, stating that cut plain tiles are not acceptable at verges

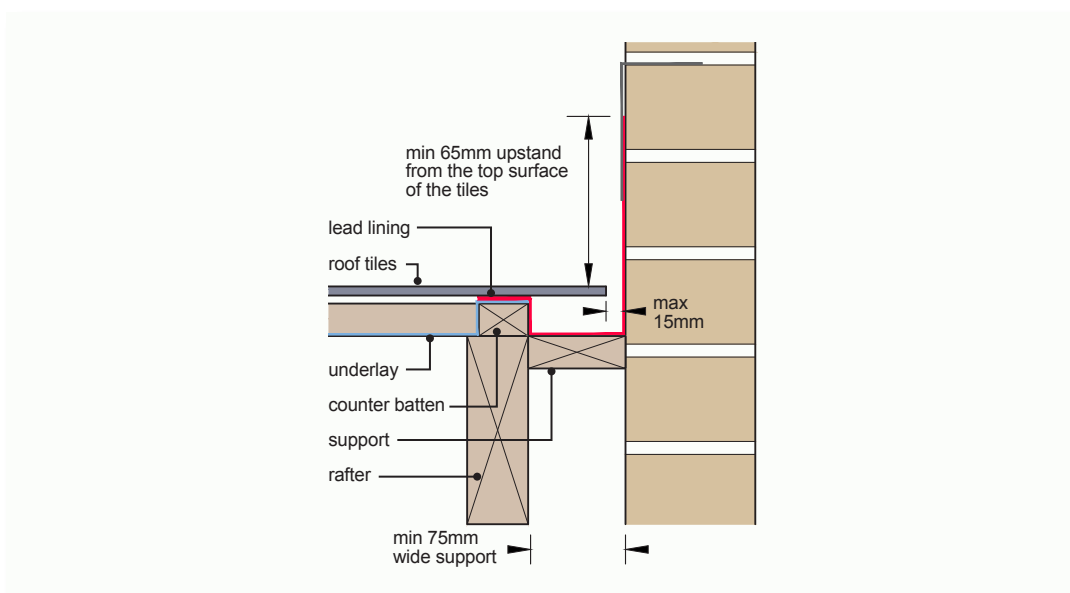
In our guidance for slate verges, we mention how slate verges should be formed with full slates and either slate-and-a-half or half slates that are a minimum of 150mm wide. However, we did not have any equivalent guidance for plain tiles. As a result, we have added guidance stating that "Cut plain tiles are not acceptable, and purpose-made plain tile-and-a-half tiles should be used".

## 12. New guidance for mortar mixes at verges (on top of the undercloak)

In 11.3.6, we have added guidance on mortar mixes at verges (on top of the undercloak). The new guidance states that the mortar should be 1:3 cement: sand with plasticiser. We have introduced this following a review of BS5534 and the latest industry practices.

## 13. Updated detail for side abutment secret gutter arrangements

In 11.3.9, we have updated our detail for side abutment secret gutter arrangements to make it easier to understand. The updated detail is as follows:



## 14. Replaced reference to 'Water Control Membrane' (WCM) with 'Water Flow Reducing Layer'

Throughout section 11.4 (Flat Roofs) and 11.5 (Green Roofs), we have replaced the term 'Water Control Membrane' (WCM) with 'Water Flow Reducing Layer'. This is to bring our guidance in line with BS6229.

## 15. Further guidance on what ballast can be used to secure the insulation on an inverted warm deck roof, including the required minimum weight

In the new section 11.4.1 for Flat Roofs, we have added further guidance to our 'Inverted warm deck roof' guidance. The text provides more examples of what ballast can be used to secure the principal insulation on the roof, and notes that the minimum weight of the ballast should be 80kg/m<sup>2</sup>.

The updated text is highlighted below:

A variant of the warm deck roof in which the principal thermal insulation is placed above the waterproof membrane, resulting in the waterproof membrane, structural deck and structural support being at a temperature close to that of the interior of the building. Generally, the principal insulation is secured by separate ballast (paving, gravel, or blue/green roof - minimum 80 kg/m<sup>2</sup>).

## 16. Updated note regarding the moisture content of roof decks whilst installing the waterproofing membrane

We have updated our note above the 'Typical deck construction (warm roof)' image in 11.4.5 to now say:

Permanent waterproofing should not be installed until the moisture content of the deck is as per the membrane manufacturer's recommendations. Preparation of the receiving substrates should also be as per the membrane manufacturer's guidance.

## 17. New note for lateral restraint of walls in section 11.4.4 and 11.4.5

In the new section 11.4.4 and 11.4.5, we have a small note on the lateral restraint of walls, which also redirects people to our guidance in the 'External Walls' section. The new note is as follows:

### Lateral restraint of walls

Walls should be adequately restrained at floors, ceilings and verges in accordance with the relevant Building Regulations.

Restraint can be provided by:

- Lateral restraint straps.
- Restraint type joist hangers.
- Other forms of restraint proven by the Engineer.

Please refer to the 'External Walls' section for further guidance.

## 18. New guidance for where rainwater downpipes from higher roof areas discharge via a lower roof

We have added a new bullet point under the 'Drainage' heading in section 11.4.8, stating the following:

- Where rainwater downpipes from other higher roof areas, balconies or terraces discharge via a lower roof, an open downpipe shoe is not permitted. The downpipe should be connected directly to the downpipe serving the lower roof.

## 19. Updated images for drainage layout options

We have updated our image in section 11.4.8 and 11.5.4 following feedback that they're not always easily achievable on site. We have also included a note stating that 'Drainage layout options are for illustrative purposes only and should be further developed by a suitably experience drainage designer prior to roofing work commencing'. See section 11.4.8 and 11.5.4 to familiarise yourself with the new guidance.

## 20. Updated guidance on perimeter restraint for polymeric single ply roofs in 11.4.9

Following consultation with the Single Ply Roofing Association, we have added a few additional points to our existing guidance regarding perimeter restraint for polymeric single ply membranes. The additional points can be seen highlighted below:

Perimeter restraint is achieved by several methods, depending upon the manufacturer:

- Individual fasteners, protected by a flashing.
- A linear bar, protected by a flashing.
- Clamping underneath a mechanically fastened, membrane-laminated trim, with the line of fixings waterproofed by a cover strip.
- Welding the field sheet to a membrane-coated metal trim secured to the deck (with thermal break fasteners where appropriate). This is not recommended for fully adhered membranes.

If the remainder of the roof system is to be bonded, it is essential that the design resistance to wind load is also achieved for the attachment of these components.

## 21. Replaced references to 'Liquid applied roof waterproof kits (LARWK)' with 'Liquid applied membranes' in 11.4.10

Throughout section 11.4.10, we have replaced references to 'liquid applied roof waterproofing kits (LARWK) with 'liquid applied membranes' following consultation with the Liquid Roofing and Waterproofing Association.

## 22. Additional guidance added regarding certification of liquid applied membranes

We now provide guidance regarding the certification of liquid applied membranes, stating that evidence of appropriate certification should be provided to demonstrate its suitability for its proposed use. This guidance also discusses how there is no European Product Specification for liquid applied membranes for roofing, and how many may be covered by European Assessment Document (EAD) 030350-00-0402. The new guidance is as follows:

There is no harmonised European Product Specification for liquid applied membranes for roofing. There are many types of liquid applied membranes and many may be covered by European Assessment Document (EAD) 030350-00-0402 'Liquid Applied Roof Waterproofing Kits' (EADs are the basis for issuing European technical assessment (ETA's) certificates).

Evidence of appropriate certification should be provided to demonstrate its suitability for its proposed use.

This has been added following consultation with the Liquid Roofing and Waterproofing Association, and can be found in section 11.4.10.

## 23. Updated coverage rate for liquid applied membranes

In section 11.4.10, have updated our statement regarding the coverage rate of liquid applied membranes. Previously, we stated that the coverage rate in kg/m<sup>2</sup> must be declared before works start. We now state that the coverage rate in kg/m<sup>2</sup> or l/m<sup>2</sup> must be declared before work starts.



## 24. New references added regarding installation of liquid applied membranes

In section 11.4.10, we list a number of guidance documents that should be referred to regarding the installation of liquid applied membranes, as per guidance from the Liquid Roofing and Waterproofing Association. Following consultation with the LRWA, we have added additional documents to our list.

The additional documents are as follows:

- Guidance Note No 11 – Use of Adhesives for Liquid Flat Roof Systems.
- Guidance Note No 12 – Termination of Waterproofing at Cills and Thresholds.
- Guidance Note No 13 – Drying of Existing Roof Substrates Prior to Installation of Liquid Waterproofing Systems.
- Guidance Note No 16 – Walls Built onto Waterproofing Systems.
- Guidance Note No 17 – Best Practice for the Installation of a Flues Passing Through a Flat Roof.

## 25. Additional guidance added regarding certification of site-applied hot melt coverings

We now provide further guidance regarding the certification of site-applied hot melt coverings.

The additional guidance is highlighted below:

There is no harmonised European Product Specification for site-applied hot-melt waterproofing systems. Hot applied polymer modified bitumen (hot melt) is covered by European Assessment Document (EAD) 030065-00-0402 'Composite Roof Waterproofing Kits'. EADs are the basis for issuing European technical assessment (ETA's) certificates.

The manufacturer of a product for use in flat roofing should declare compliance with the relevant parts of the relevant European Assessment Document (EAD). In the absence of this declaration, the product should have a current certificate of fitness for purpose issued by one of the following:

- British Board of Agrément.
- Another member of the UEAtc.
- Another notified body.

Evidence of appropriate certification should be provided to demonstrate its suitability for its proposed use.

This has been added following consultation with the Liquid Roofing and Waterproofing Association, and can be found in section 11.4.11 under the 'Site-applied hot melt coverings' heading.

## 26. Moved guidance on mechanical and electrical services, support for renewable energy capture equipment, edge protection, and fall arrest and edge protection equipment

We have moved our guidance on 'Mechanical and electrical services', 'Support for renewable energy capture equipment', 'Edge protection', and 'Fall arrest and edge protection equipment' from section 11.6.13 of the previous Technical Manual, to the new section 11.4.15 to improve the flow and order of the guidance.

## 27. Additional guidance for the testing of flat roofs

In section 11.4.14, we have added additional guidance for the testing of flat roofs. The new text can be found under the 'Testing' heading, is as follows:

In all circumstances, testing should be carried out when the first flat roofs are completed in order to determine if there are any inherent issues with the design or workmanship. Where there is a failure the root cause should be determined and appropriate remedial actions should be taken. The Warranty Surveyor may request an increase in the amount of testing required.

## 28. New guidance detailing what evidence an approved installer should provide to show they are approved by the manufacturer to install their products

In section 11.4.14 and 11.5.5, we have added guidance regarding what you would typically expect to see as evidence that an installer is approved by the manufacturer to install their products. This is typically in the form of an identity card, which features the installer's name; a passport-style photograph; a unique card number; an expiry date; the manufacturer's name and logo; and lists the products and/or systems for which the installer has been trained.

## 29. New text stating that the Operations and Maintenance Manual should be provided to the home owner upon completion

In section 11.4.14, under the heading 'Periodic inspections and maintenance', we discuss how periodic inspections and maintenance should be completed in line with the Operations and Maintenance Manual for the project. We now also state that the operations and maintenance manual should be provided to the home owner upon completion.

## 30. Updated/new definitions in the 'Green Roofs' section

We have added/updated the following definitions in the new section 11.5.1 (Green Roofs):

**BioSolar roof:** A system of using green roof materials to hold solar photovoltaic panels in place.

**Blue roof:** a roof level rainwater attenuation system forming part of a SuDS strategy to mitigate flood risk. Typically installed beneath a green roof. Please refer to the 'Roofs – Blue Roofs' section for further guidance on blue roofs.

**Extensive green roof:** a lightweight, low maintenance roof system, typically with succulents or other hardy plant species (often sedum) planted into a shallow substrate (typically less than 100 mm) that is low in nutrients. Irrigation is not normally required. A variant using Wildflower species will require a deeper substrate (typically 100mm to 150mm depending on species mix). Permanent irrigation is not required but it is advisable to include an option to irrigate in times of drought.

**GRO:** Green Roof Organisation, the industry forum for green roof development and promotion in the UK. GRO publish the Green Roof Code of Best Practice amongst other technical guidance.

### 31. For green roofs, we've updated our roof deck options to include both warm decks and inverted warm decks

In the previous section 11.7.2 (now 11.5.2), we stated that "...the warm deck configuration is recommended unless there are specific design circumstances...". Under the 'Design and system types' heading, we now state the following:

The roof system may be of warm deck or inverted warm deck configuration. The approach taken will be dependent on a number of variables which should be considered by the designer. The chosen approach should be discussed with the Risk Management Surveyor as early as possible to ensure all Warranty risks are mitigated.

For Warranty purposes, cold deck roofs are not suitable for green roof applications.

### 32. Updated guidance regarding vegetation free zones on green roofs in 11.5.3

We have updated our guidance, following consultation with GRO, on how to achieve a vegetation free zone at perimeters, abutments, and openings on green roofs. We previously said that "A vegetation-free zone of minimum 0.5m width at all perimeters, abutments and openings." We have now added to that, saying:

A vegetation-free zone of minimum 0.5m width consisting of either 20 – 50mm rounded gravel at 75mm depth or 40mm thick paving slabs at all vertical perimeters, vertical abutments and vertical openings. This zone should be extended to 1m to separate large roof zones in excess of 40m in length.

### 33. New guidance for periodic inspection and maintenance of green roofs in 11.5.5

We have added the following new guidance in section 11.5.5 explaining our requirements regarding the periodic inspection and maintenance of green roofs:

#### Periodic inspection and maintenance

Periodic inspections and maintenance should be completed in line with the advice provided within the Operation and Maintenance Manual for the project, by an appropriately skilled or trained party. The operations and maintenance manual should be provided to the home owner upon completion.

As a minimum it is advisable that a flat roof is inspected at least twice yearly. Typically in the autumnal period of the year to ensure outlets are operational and the roof is free draining to deal with any subsequent inclement weather conditions in coming winter months. A further inspection is then carried out in spring to discover and rectify any damage due to weather.

Extra inspections are advisable following any extreme weather events or where it is suspected that vandalism, and/or theft may have occurred on the roof. As a minimum, it is advisable that any inspections should include the following elements:

- An examination of ceilings for signs of water damage.
- An examination of external walls, eaves and soffits for signs of movement.
- Signs of damage to the roof surface and subsequent layers of construction along with associated flashings.
- Mounted or ballasted roof top installations e.g. safety equipment, communications and renewable energy installations should be examined to ensure their attachment and associated work remains waterproof.
- Extensive build-up of leaves, moss, plants or debris should be recorded along with any influencing factors such as the effect of overhanging trees, mounted plant items, etc.

It is advisable that when additional construction work is planned on or near to the roof, an appropriate and specific inspection regime is established to cover the aspects of risk associated with the work at hand.

### 34. Restructure of our 'Blue Roof' section

We have restructured our section 11.7 (previously 11.9) 'Blue Roofs' following a review. This is to improve the flow and readability of the guidance. Take some time to familiarise yourself with the new layout of the guidance.

# Roof Terraces and Balconies

## 1. Updated Limitations of Functional Requirement note regarding means of escape, passive and active systems

In the previous Technical Manual, we stated that 'Means of escape, passive and active systems are not covered by the Warranty unless specifically identified in the appropriate 'Building Part' section. We have updated this so that it now only states:

### Limitations of Functional Requirements

3. Means of escape, passive and active systems are not covered by the Warranty.

## 2. Updated Functional Requirement regarding cold deck roof terraces

We have updated our existing Functional Requirement Design note 1. The existing Functional Requirements states that, for Warranty purposes, flat cold deck balcony terrace roofs are not acceptable. We now say the following:

### Design

1. For Warranty purposes, cold deck roof terraces are not acceptable.

## 3. Changed reference to 'drainage system' to 'outfall' in our Functional Requirements

Within our Functional Requirement Design note 2.d, we have changed our reference to 'drainage system' to 'outfall' so that the Functional Requirement now reads:

2. Roof terrace and balcony structures and coverings, shall be designed and constructed so that they:
  - d. Adequately discharge rainwater to a suitable **outfall**.

## 4. Replaced references to 'Liquid applied roof waterproof kits (LARWK)' with 'Liquid applied membranes' throughout section 12

Throughout section 12, we have replaced references to 'liquid applied roof waterproofing kits (LARWK)' with 'liquid applied membranes' following consultation with the Liquid Roofing and Waterproofing Association.

## 5. Replaced reference to 'Water Control Membrane' (WCM) with 'Water Flow Reducing Layer'

Throughout section 12.1, we have replaced the term 'Water Control Membrane' (WCM) with 'Water Flow Reducing Layer'. This is to bring our guidance in line with BS6229.

## 6. Further guidance on what ballast can be used to secure the insulation on an inverted warm deck roof terrace, including the required minimum weight

In section 12.1.3, we have added further guidance under the 'Design' heading. The text provides more examples of what ballast can be used to secure the principal insulation on the roof, and notes that the minimum weight of the ballast should be 80kg/m<sup>2</sup>.

The updated text is highlighted below:

A variant of the warm deck roof terrace in which the principal thermal insulation is placed above the waterproof membrane, resulting in the waterproof membrane, structural deck and structural support being at a temperature close to that of the interior of the building. Generally, the principal insulation is secured by separate ballast (paving, gravel, or blue/green roof - minimum 80 kg/m<sup>2</sup>).

## 7. New note for lateral restraint of walls in section 12.1.4, 12.1.5, and 12.1.6

In the sections 12.1.4, 12.1.5, and 12.1.6, we have a small note on the lateral restraint of walls, which also redirects people to our guidance in the 'External Walls' section. The new note is as follows:

### Lateral restraint of walls

Walls should be adequately restrained at floors, ceilings and verges in accordance with the relevant Building Regulations.

Restraint can be provided by:

- Lateral restraint straps.
- Restraint type joist hangers.
- Other forms of restraint proven by the Engineer.

Please refer to the 'External Walls' section for further guidance.

## 8. Updated note regarding the moisture content of roof decks whilst installing the waterproofing membrane

We have updated our note above the 'Typical warm deck construction' image in 12.1.5 to now say:

Permanent waterproofing should not be installed until the moisture content of the deck is as per the membrane manufacturer's recommendations. Preparation of the receiving substrates should also be as per the membrane manufacturer's guidance.

## 9. Updated images for drainage layout options

We have updated our image in section 12.1.8 following feedback that they're not always easily achievable on site. We have also included a note stating that 'Drainage layout options are for illustrative purposes only and should be further developed by a suitably experience drainage designer prior to roofing work commencing'. See section 12.1.8 to familiarise yourself with the new guidance.

## 10. Updated guidance on perimeter restraint for polymeric single ply membranes

Following consultation with the Single Ply Roofing Association, we have added a few additional points to our existing guidance regarding perimeter restraint for polymeric single ply membranes in section 12.1.9. The additional points can be seen highlighted below:

Perimeter restraint is achieved by several methods, depending upon the manufacturer:

- Individual fasteners, protected by a flashing.
- A linear bar, protected by a flashing.
- Clamping underneath a mechanically fastened, membrane-laminated trim, with the line of fixings waterproofed by a cover strip.
- Welding the field sheet to a membrane-coated metal trim secured to the deck (with thermal break fasteners where appropriate). This is not recommended for fully adhered membranes.

If the remainder of the roof system is to be bonded, it is essential that the design resistance to wind load is also achieved for the attachment of these components.

## 11. Additional guidance added regarding certification of liquid applied membranes

We now provide guidance regarding the certification of liquid applied membranes, stating that evidence of appropriate certification should be provided to demonstrate its suitability for its proposed use. This guidance also discusses how there is no European Product Specification for liquid applied membranes for roofing, and how many may be covered by European Assessment Document (EAD) 030350-00-0402. The new guidance is as follows:

There is no harmonised European Product Specification for liquid applied membranes for roofing. There are many types of liquid applied membranes and many may be covered by European Assessment Document (EAD) 030350-00-0402 'Liquid Applied Roof Waterproofing Kits' (EADs are the basis for issuing European technical assessment (ETA's) certificates).

This had been added following consultation with the Liquid Roofing and Waterproofing Association, and can be found in section 12.1.10.

## 12. New references added regarding installation of liquid applied membranes

In section 12.1.10, we list a number of guidance documents that should be referred to regarding the installation of liquid applied membranes, as per guidance from the Liquid Roofing and Waterproofing Association. Following consultation with the with the LRWA, we have added additional documents to our list.

The additional documents are as follows:

- Guidance Note No 11 – Use of Adhesives for Liquid Flat Roof Systems.
- Guidance Note No 12 – Termination of Waterproofing at Cills and Thresholds.
- Guidance Note No 13 – Drying of Existing Roof Substrates Prior to Installation of Liquid Waterproofing Systems.
- Guidance Note No 16 – Walls Built onto Waterproofing Systems.
- Guidance Note No 17 – Best Practice for the Installation of a Flues Passing Through a Flat Roof.

## 13. Updated coverage rate for liquid applied membranes

In section 12.1.10, have updated our statement regarding the coverage rate of liquid applied membranes. Previously, we stated that the coverage rate in kg/m<sup>2</sup> must be declared before works start. We now state that the coverage rate in kg/m<sup>2</sup> or l/m<sup>2</sup> must be declared before work starts.

## 14. Additional guidance added regarding certification of site-applied hot melt coverings

We now provide further guidance regarding the certification of site-applied hot melt coverings.

The additional guidance is highlighted below:

There is no harmonised European Product Specification for site-applied hot-melt waterproofing systems. Hot applied polymer modified bitumen (hot melt) is covered by European Assessment Document (EAD) 030065-00-0402 'Composite Roof Waterproofing Kits'. EADs are the basis for issuing European technical assessment (ETA's) certificates.

The manufacturer of a product for use in flat roofing should declare compliance with the relevant parts of the relevant European Assessment Document (EAD). In the absence of this declaration, the product should have a current certificate of fitness for purpose issued by one of the following:

- British Board of Agrément.
- Another member of the UEAtc.
- Another notified body.

Evidence of appropriate certification should be provided to demonstrate its suitability for its proposed use.

This had been added following consultation with the Liquid Roofing and Waterproofing Association, and can be found in section 12.1.10 under the 'Site-applied hot melt coverings' heading.

## 15. Additional guidance for the testing of roof terraces

In section 12.1.15, we have added additional guidance for the testing of roof terraces. The new text is as follows:

In all circumstances, testing should be carried out when the first roof terraces are completed in order to determine if there are any inherent issues with the design or workmanship. Where there is a failure the root cause should be determined and appropriate remedial actions should be taken. The Warranty Surveyor may request an increase in the amount of testing required.

## 16. New guidance detailing what evidence an approved installer should provide to show they are approved by the manufacturer to install their products

In section 12.1.15, we have added guidance regarding what you would typically expect to see as evidence that an installer is approved by the manufacturer to install their products. This is typically in the form of an identity card, which features the installer's name; a passport-style photograph; a unique card number; an expiry date; the manufacturer's name and logo; and lists the products and/or systems for which the installer has been trained.

## 17. New text stating that the Operations and Maintenance Manual should be provided to the home owner upon completion

In section 12.1.15, under the heading 'Periodic inspections', we discuss how periodic inspections and maintenance should be completed in line with the Operations and Maintenance Manual for the project. We also state that the operations and maintenance manual should be provided to the home owner upon completion.

# Driveways and Paving

## 1. Additional guidance for when retaining walls are specified

In section 14.1.1 we currently have guidance explaining that retaining walls, when specified to provide support to the structure or primary entrance to the property, should be designed by an Engineer (note, that retaining walls are outside the scope of our guidance).

We have now expanded on this, and made it clear that flexible retaining walls such as gabions and timber structures **should not** be specified to provide support for the home, garage, driveway, car parking areas, roads or drainage systems.

The new wording below can be found in section 14.1.1 under the heading 'Retaining walls':

Gabions, timber structures and other types of flexible retaining walls should not be specified to provide support to homes, garages, roads, drives, car parking areas or drainage systems.



# Ventilation and Extraction

## 1. New guidance for the location of air inlets and exhausts in 16.1.3

We have added some new guidance explaining the correct positioning of MVHR inlets, and we also state that an MVHR specialist **must** provide a design proposal for the specific location to confirm that the system will function correctly.

The new guidance, as shown below, can be found in section 16.1.3 of the new Technical Manual under the heading 'Location of air inlets and exhausts'.

The location of MVHR inlets must be sited away from nearby pollution sources such as boiler flues, chimneys, ventilation extracts, SVP etc. An MVHR specialist must provide a design proposal for the specific location to confirm the system will function correctly.

# Garages

## 1. Simplified text for the 'Limitations' paragraph in 19.1.1

We have simplified the guidance given in the 'Limitations' paragraph in section 19.1.1. This paragraph is there to explain the limitations of the guidance we provide within the section. The simplified guidance now states:

This section does not apply to a garage that:

- Is heated.
- Is used as a habitable space.
- Requires the walls to resist wind-driven rain.
- Is intended to have decorative finishes e.g. floor coverings or plastered walls.

## 2. New guidance for services within a garage in 19.1.1

We have added new guidance in section 19.1.1 for where services or appliances are sited within an uninhabitable garage space, under the heading 'Services within a garage'. The new guidance is as follows:

Where services or appliances are sited within an uninhabitable garage space:

### Water services

- The rising main should not be located within the garage.
- Any Water supply or outlet must have suitable provision for isolating and draining down.
- Pipes must have suitable protection against freezing.

### Electricity

- All electric installations should comply with BS 7671.

### Risk of fire or explosion

- Installation of boilers and heating appliances should be in accordance with relevant statutory regulations.

## 3. New guidance stating that concrete garage floors should not be tamped in 19.1.1

Currently in section 19.1.1, under the heading 'Garage floor', we state that "The concrete should be float finished and to at least a GEN3 grade...". We now also state that it should not be tamped, as follows:

- The concrete should be float finished (**not tamped**) and to at least a GEN3 grade. As the garage is not a habitable space some surface imperfections of the floor finish are acceptable.

## 4. Updated guidance for garage floors where the garage is integral to the house

Currently in section 19.1.1, we provide guidance stating that we recommend that garage floors are laid to falls *or* have a suitable step where an integral garage is present. We now say that we recommend that garage floors are laid to falls *and where practical*, a step be provided where the garage is integral to the house. See section 19 for a better look.

# Tolerances

## 1. Guidance on scratches to doors, windows and frames has been removed

In section 20.1.6 of the previous Technical Manual (in the right hand column) we had guidance under the heading 'Scratches on doors, windows and frames'. This guidance has now been **removed** as it included an error in the title (the guidance should only have referred to scratches on window and door frames, not scratches on windows, doors, and frames). Scratches on windows is covered separately.

# Appendix A

## 1. New text for the taping and jointing of plasterboard

In the new appendix A.1.1, under the 'Tape and jointing' heading, we have added new guidance covering the taping and jointing of plasterboard to internal walls and ceilings. This discusses durability, fire and sound insulation requirements, and material specification.

The new text is as follows:

Where plasterboards to internal walls and ceilings are to be taped and jointed, and not plastered they must:

- Be durable enough to prevent surface cracking.
- Meet the required levels of fire and sound insulation in accordance with current Building Regulations (i.e. proven to achieve the standards without a plaster skim coat).
- Have all materials (such as tape, jointing compound etc.) that are specified, to be a part of the board manufacturer's system or approved by the board manufacturer for use with their board.

Please note, tapered edge boards must be used for directly applied finishes where plasterboards are not to be plastered.

# Appendix B

## 1. Updated Functional Requirement regarding the suitability and durability of materials, components and external surfaces

We have updated Functional Requirement number 1 under the 'Materials' heading, to now state that "Materials, components and external surfaces should be suitable...". Previously 'components and external surfaces' were not included.

The updated Functional Requirement is as below:

### Materials

1. Materials, **components and external surfaces** should be suitable and appropriately durable for the aggressive environment that the building is located.

# Appendix C

## 1. Removed previous Functional Requirement Design number 1

We have removed what was Functional Requirement Design number 1 in the previous Technical Manual, which stated 'All products must be independently proven and/ or have a third party product approval certification by recognised UKAS or equivalent product conformity body to verify suitable for the intended use.'

This is to avoid confusion, as it was very similar to Functional Requirement Materials number 2, which states 'All materials, products and building systems shall be appropriately tested and approved for their intended purpose.'

## 2. Changes to the look/order of C.1.1 and C.1.2

The old guidance in C.1.1 and C.1.2 has been refined/condensed to improve how the content reads. We have also removed the diagrams showing how to store timber on site, to avoid confusion.

## 3. New guidance on the use of other 'green' timber species in C.1.2

In section C.1.2 we have included new guidance on the use of other 'green' timber species instead of oak. This states:

Where 'green' timber species are specified based on the required service life as specified within this section.

## 4. New tables in C.1.12 C.1.13 regarding steelwork protection categories in varying environments and corrosion ratings

We have included a new table in section C.1.12 titled 'Table 1: Hotrolled steelwork environment and protection categories', which provides guidance for steelwork protection categories in varying environments.

We have also added a new table in section C.1.13 titled 'Table 2: Steelwork corrosion rating and protection categories'. This replaces the table titled 'Classification of Environmental Corrosion Conditions...' which was in section C.1.12 of the previous Technical Manual.

Previews of the two tables can be seen below. Have a look in the new Technical Manual for the full tables:

**Table 1: Hotrolled steelwork environment and protection categories**

Area	Condition	Description	Environment Categories
External	Outside	All steelwork	C4 or C5 – Note 1
Building Envelope	Facade	All steelwork	C4 or C5 – Note 1
Building Envelope	Cavity zone: Very high corrosion risk - Coastal locations and areas within (500m) from the shoreline	All steelwork located within the cavity zone should be galvanised	C4 or C5 – Note 1
Building Envelope	Cavity zone: High corrosion risk - Coastal locations and areas located (1km to 0.5km) from the shoreline	All steelwork located within the cavity zone should be galvanised	C4 or C5 – Note 1
Building Envelope	Cavity zone: Reduced corrosion risk - Coastal locations and areas over (5km) from the shoreline	Steelwork protection category will depend on location within cavity	Note 2 and Note 3
Building Envelope	Basement and steelwork below ground level	Full or partial basement situation	C5 - Note 1 and 4
Internal	Sub-floor void	Steelwork not in contact with the ground	C3
Internal	Internal swimming pool	Steelwork located in areas that can be effected by chemicals	C4 - Note 1
Internal	Kitchen	Protected against condensation	C2
Internal	Bathrooms	Protected against condensation	C2
Internal	Roof voids	Unheated	C2

**Table 2: Steelwork corrosion rating and protection categories**

Corrosivity Rating	Corrosion Protection	Protection Thickness	Number of coats	Comments:
C1 Interior Dry	High build zinc phosphate epoxy primer.	80 µm	1 or 2	
C2 Interior Rural Occasional Condensation	High build zinc phosphate epoxy prime	80 µm	1 or 2	
C3 Interior Urban Inland some air pollution located over (5km) from the shoreline.	High build zinc phosphate epoxy primer (80 µm) + high build epoxy over (120 µm)	200 µm	1 or 2	Steelwork protection category will depend on location within cavity
C4 Coastal locations and areas between (5km to 1km) from the shoreline.	Hot Dip Galvanise to BS EN ISO 1461	85 µm	1	All steelwork located within the cavity zone should be galvanised.
C5 High Humidity or Coastal with High Salinity within (500m) from the shoreline.	Hot Dip Galvanise to BS EN ISO 1461	140 µm	1	All steelwork located within the cavity zone should be galvanised
CX or C5 + Coastal Splash Zones	Specialist design including a site specific assessment required	As per the Engineers specifications	As per the Engineers specifications	Additional risks to consider in splash zones: Accelerated Low Water Corrosion. (ALWC)

## 5. Updated reference to horizontal timber decking in our 'Service life' table

Within our Service Lift table (which is now in Appendix C.1.15), we have made slight amendments to how we refer to horizontal timber decking. Previously, we referred to it as 'Horizontal timber decking (structural walking surface)'. We now refer to it as 'Horizontal timber decking boards (structural walking surface, not supporting structure/joists)'.

<p><b>Horizontal timber decking boards (structural walking surface, not supporting structure/joists)</b></p> <ul style="list-style-type: none"> <li>Up to 600mm above the ground</li> <li>Between 600mm and 2400mm above the ground</li> <li>Greater than 2400mm above the ground level</li> </ul> <p>Note: All structural elements of a balcony = 60 years</p> <p>Decking will need planned maintenance, repair or replacement during that reduced period. Does not take account of other legislative requirements e.g. fire resistance</p>	<p>15 years 30 years 60 years</p> <p>60 years</p>
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## 6. Thermal insulation and breather membranes added to the 'Service life' table

We have updated the service life table in C.1.15 to now include non loadbearing elements in the external wall and roof constructions that do not form part of the water proof envelope e.g. insulation (as below):

<p><b>Non loadbearing elements in the external wall and roof constructions that do not form part of the water proof envelope</b></p> <ul style="list-style-type: none"> <li>Thermal insulation</li> </ul>	<p>25 years</p>
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We have also updated the table to include breather membranes in vertical framed external walls and pitched roofs (as highlighted below):

<p><b>External building elements not forming a structural function but part of the waterproof envelope <sup>(3)</sup></b></p> <ul style="list-style-type: none"> <li>Roof tiles and metal roof cladding</li> <li>Flat roof coverings</li> <li>Offsite manufactures MMC elements such as false glass fibre chimney stacks, coping stones, window cills</li> <li>Breather membranes in vertical framed external walls and pitched roofs</li> </ul>	<p>25 years 25 years 25 years</p> <p>25 years</p>
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## 7. New text for proprietary products/systems in place of traditional methods

We have added some new guidance for when a proprietary product or system is proposed in place of a traditional method of construction. The guidance explains how the proprietary product or system must still meet the requirements of the relevant British Standards, or have a full third party product approval certificate. The text can be found in Appendix C.2.1, and is as follows:

Where a proprietary product or system is proposed in place of a traditional construction method, the product or system must still meet the requirements of the relevant British Standard or have a full third party product approval certificate.

## 8. Third party product conformity certificates must be valid and current

In C.2.1 we also now state that third party product conformity certificates must be valid and current.

## **9. New guidance on our minimum requirements regarding the suitability of products, plus how these can be satisfied**

In appendix C.2.1, under the heading 'Suitability of products', we have added guidance regarding what factors must be taken into consideration as a minimum when selecting products. This covers things like durability, structural integrity, quality control, and more. We also provide guidance around how to prove that products satisfy these factors, for example, by providing a valid full third party product approval, by providing evidence that the products met the requirements of relevant standards, or by providing evidence of CE/UKCA markings where applicable.

This new guidance should be followed to ensure that any products specified can be proven to satisfy the relevant Functional Requirements of the Technical Manual. Take a look in appendix C.2.1 to familiarise yourself with the new guidance

## **10. New guidance for the minimum required supporting information for cavity trays and DPCs**

We have created new guidance specifying the minimum required supporting information for cavity trays and DPCs. This new guidance sits on a new page titled 'Minimum required supporting information for cavity trays and DPCs'. See section C.2.2 of the new Technical Manual for a better look.

## **11. Updated guidance for claddings on ICF structures in C.2.4**

In the previous Technical Manual, we provided guidance for situations where ICFs may be directly rendered and where EWI systems may be used. This has been removed as they are no longer acceptable for Warranty purposes.

## **12. New text stating that all cladding types for ICF structures are to be specified by an Engineer**

In section C.2.5, we have added a new point under the 'Cladding for ICF structures' heading, stating:

- The fixing specification for all cladding types for ICF structures must be specified by an Engineer.



# Appendix D

## 1. New text added regarding the refurbishment process

In the previous version of the Technical Manual, in section D.1.1, we had guidance under the heading 'The process'. This has now been retitled to 'The refurbishment assessment process', and the following text has been added:

The building elements considered likely to be acceptable for retention will be identified by the Technical Services Surveyor and be subject to non-negotiable, site-specific, technical conditions called refurbishment assessment design items that must be fully satisfied before the scheme can be recommended as a standard risk to the underwriter. There may be instances where additional investigations and/or information is required to address the design items in full. Failure to address the design items in full may result in the offer of Warranty being withdrawn.

All conversion schemes are different and there is no one set of technical conditions or list of information that can adequately demonstrate the validity of every scheme. The refurbishment assessment design items set out in detail the basis of the investigation or means of proving those building elements proposed for retention are suitable for Warranty and will satisfy the Functional Requirements.

Survey reports or design work commissioned before the refurbishment assessment may not meet the technical requirements of the Warranty and, therefore, may require additional investigation and/or amendments.

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