This is the first session of a three session series on pitched roof coverings. The series provides a practical approach to raising the standards of pitched roof coverings on-site.

This session identifies what is going wrong with pitched roof covering.

Key learning points are identified with this symbol: 🚭
NHBC would like to acknowledge and thank the following for their input and support associated with this session:

- The National Federation of Roofing Contractors Limited
- Forticrete
- Marley Eternit
- Redland
- Sandtoft

This session takes a non-product specific, general approach for the following reason, manufacturer’s may have their own very specific specification or fixing requirements. Therefore please make use of the manufacturer’s technical product support relevant to the products used on your site.

NHBC would like to thank The Crowood Press Ltd for giving permission to use their images in this learning series. These images are from the book:

Aims of this e-learning series

After each individual e-learning session you should:

This session

Where is it all going wrong?
- Know the extent of pitched roof claims
- Be clear where to focus your attention as a supervisor

Session 2

Wet mortar work essentials
- Understand the correct use of mortar on roofs
- Appreciate the benefits of adopting a team approach on site
- Be aware of alternative solutions

Session 3

Weathering details & fixing
- Have a good understanding of typical roof weathering details
- Appreciate the importance of correct fixing

Adopting a team approach can be beneficial for all
NHBC warranty cover was extended in 1997 to include pitched roof coverings. Unfortunately, current claims figures do not make for comfortable reading.

Claims on pitched roof coverings have continued to rise. Our latest information from claims, inspections and site surveys will help you understand what the issues are, and what steps can help to substantially improve this situation.

In 2010, NHBC spent more than £11m on pitched roof claims, but repairs undertaken directly by builders would substantially increase this cost to the industry.

### 2010 Claims data: Section 3 claims frequency by Standards code

- **Roofs**: 59%
- **Superstructure**: 30%
- **Substructure & floors**: 5%
- **Foundations**: 2%
- **Others**: 2%
- **Services & finishes**: 1%
- **External works**: 1%
So where is it all going wrong?

It is interesting to see the impact that mortar failure is having on pitched roof covering claims. Often it is only by being reflective that we can see the direction that we need to move in/focus upon.

This learning session will indeed focus on the issues related to mortar and examples of claims/potential claims will initially be highlighted. This will be followed up with accepted good craftsmanship guidance. In addition, other claims/focus areas will also be identified.

The underlying message from this session being that there are clear benefits to be gained from:
- Good design and specification
- Effective co-ordination of trades
- Informed supervision

2009/2010 Claims data:
Section 3 pitched roof covering claims by frequency

- Mortar failure 66%
- Flashings/detailing failures 15%
- Others (including structural) 10%
- Nailing/fixing 7%
- Material failures 2%
Mortar

Our claims data shows more than half of pitched roof claims found valid in 2010 related to mortar issues.

Our latest roof survey was carried out during 2010, we included questions relating to mortar mix in this latest survey of ‘live’ sites, and worryingly, a large number were reported to be using incorrect mortar mixes on the roof. Disappointingly, this has increased since we undertook the previous roof survey in 2008!

However, mortar issues don’t affect all areas of the country to the same extent. Our survey suggested that almost all sites in Scotland are now being built with dry systems for ridges, verges and hips. Our claims figures appear to support this move to dry systems, with Scotland experiencing a smaller proportion of pitched roof claims per property covered.

2009/2010 Claims data:
Section 3 pitched roof covering claims by frequency

- Ridge & hip mortar 42%
- Verge mortar 35%
- Valley mortar 23%
Ridge claims/potential claims

1. Inadequate head lap and subsequent mortar bed.

2. Mortar failure, inadequate bedding and lack of dentil slip tiles.

3. Mortar bed/finish not formed in one operation (i.e. the mortar must act as one material and not two layers)

4. Mortar failure and inadequate mechanical fixing.

The revised Chapter 7.2 now requires: where bedded in mortar, all ridge tiles should be mechanically fixed with self sealing non-ferrous fixings into timber battens.
Hip claims/potential claims

1. Mortar failure and lack of dentil slip tiles.
2. Tile fixing failure/inadequately fixed tile at hip detail.
3. Incorrect detailing at hip/ridge interface.
4. Bonnet hips bedded only. Mortar bed/finish will not be formed in one operation.

The revised Chapter 7.2 now requires: where bedded in mortar, all hip tiles should be mechanically fixed with self sealing non-ferrous fixings into timber battens.
### Verge claims/potential claims

<table>
<thead>
<tr>
<th>1. Undercloak overhang in excess of 30-60mm for interlocking tiles (38-50mm for double lap tiles), together with poor undercloak alignment.</th>
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<tbody>
<tr>
<td>2. Undercloak and verge tiles not bedded.</td>
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<tr>
<td>3. Mortar not bedded and finished in same material</td>
</tr>
<tr>
<td>4. Verge does not have any clips. Insufficient mortar bed with little or no compression of the mortar.</td>
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The revised Chapter 7.2 requires that: verge slates or tiles should be bedded on an undercloak, and that the bedding and pointing be completed in one operation.
**Valley claims/potential claims**

1. Incorrect detail at the head of the valley and mortar failure to the valley.

2. Mortar failure to valley.

3. Early stages of failure. Note also that there is no undercloak on the lead valley. Damaged tiles are also shown.

4. The unacceptable practice of bedding and setting back. The mortar bed and finish will not be formed in one operation.

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The revised Chapter 7.2 requires a minimum Code 4 lead or other suitable saddle flashing at the head of all valleys.
1. A cover flashing only is inappropriate here. Where plain tiles are used at abutments; soakers (shown) or a secret gutter must be incorporated.

2. Unsupported underlay. The rafter position required trade co-ordination.

3. Excessively small cuts.

4. The minimum flashing upstand should be 75mm. At the top of the hip; a saddle flashing or a hip bedded on a lead cover flashing with a welted bottom edge is required.
Fixing claims/potential claims

1. Tiles not fixed.
2. Tiles not fixed. Fascia board too high kicking up the tiles at eaves (pitch of tile may be lower than the manufacturer’s minimum).
3 & 4. Non use of tile and a half sizes and tile battens cut short at the valley resulting in inadequate fixing.
1. The managing agent reported a problem with the roof tiles in year 7. The degree of failure is shown in image 2.

2. This degree of failure would be expected in a 60 year old tile.

3. These vent tiles were not supplied by the tile manufacturer. They do not fit the tile interlock and failed.

4. This ridge system was incorrectly specified for this 50 degree pitched roof.
Current claims cost trend

As you can see NHBC spent 5% more on pitched roof claims in 2010 when compared to 2009.

If this trend continues in 2011, NHBC would see claims expenditure approaching £12m for this period.

It is worth noting that these costs include costs incurred by NHBC in respect of insurance claims, but do not include any costs where builders have carried out their own repairs!

2009 Claims data:
Section 3 claims costs by Standards code

- Roofs 22%
- Superstructure 28%
- Substructure & floors 24%
- Foundations 21%
- Services & finishes 2%
- External works 1%

2010 Claims data:
Section 3 claims costs by Standards code

- Roofs 27%
- Superstructure 30%
- Substructure & floors 23%
- Foundations 18%
- Services & finishes 1%
- External works 1%
Remedial works costs\consequences

This appears to be a relatively straightforward repair resulting from an inadequately fixed ridge tile and so should be quick and easy to fix.

Unfortunately it was not quick and easy to fix!

Issues involved, included:
- engineered flying scaffold required
- upon inspection, all the remaining ridge tiles required remedial work
- other homeowners made similar claims
- damage to reputation
- homeowner dissatisfaction
- homeowner disruption
Impact on homeowners

Let us not forget the impact that remedial works have on home owner satisfaction levels.

The number of homeowners affected by what can often be disruptive damage and intrusive works is disappointingly high.

NHBC is working closely with registered builders and the roofing industry to ensure that the problem areas are clearly understood.

As part of this ongoing initiative on good practice, the next e-learning sessions in this series identify some of the key areas where intervention will help raise standards in roofing, these are:
  Session 2. Wet mortar work essentials
  Session 3. Weathering details & fixing

In 2010, 59% of all claims related to pitched roofs and our claims data shows more than half of pitched roof covering claims found valid in this period related to mortar issues!
Summary - raising the standards of pitched roof coverings

You should now:

- Know the extent of pitched roof claims
- Be clear where to focus your attention as a supervisor

If in doubt, contact:

- Your NHBC inspector
- The product manufacturer’s technical department
- NFRC (if the roofer is a member)
End of session