

Fig 1 Hand-formed double-lock standing seam

This method of forming standing seams was commonly used before the widespread introduction of profiling machines. It is still used for short bay lengths and can be used for both vertical and horizontal joints in cladding.

In roofing its minimum pitch unsealed is 6degrees. With a non-hardening sealing strip such as Illmod, pitches down to 3degrees are possible, depending on exposure. Whether to seal or not should be discussed with the copper roofer. Linseed oil is still preferred as a sealant by some roofers.

If a really precise appearance is required it would be better to specify 'roll-formed' seams as shown in Fig 2 (p18).

For bay widths taken from seam centre to seam centre see Tables E (p8) and J (p10). Also see Tables M and N (p12).

The sequence notes describe the seam being formed using a seaming iron and a wooden seaming mallet. It is equally possible to use a hand-operated angle seamer to Stage 3, with a double seamer to complete Stage 4. This is both quicker and achieves a more consistent seam height.

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

* Minimum dimensions shown. Clips are more often 50mm wide.
* In most detail locations clips are spaced at 300mm centres, but see also Table L (p11).

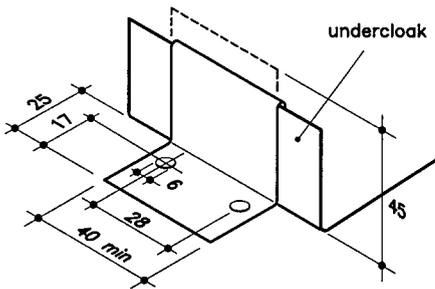
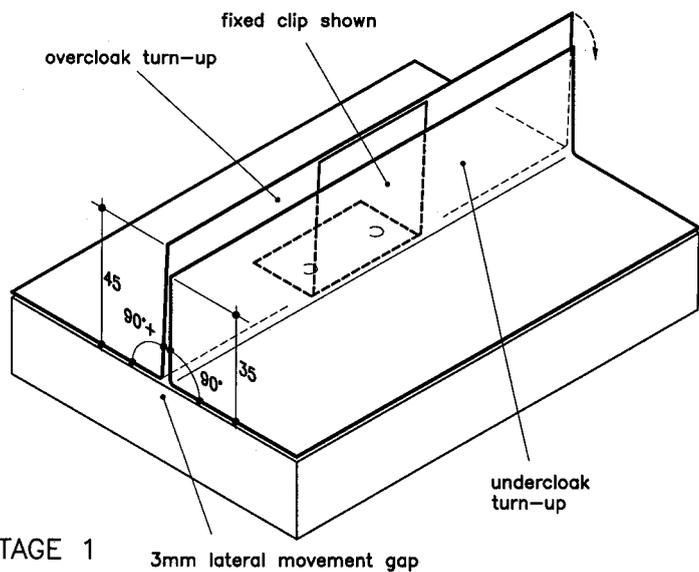


Fig 1a Fixed clips

TRADITIONAL ✓ LONG STRIP ✓



Stage 1

Form edge turn-ups for overcloak of 45mm and for undercloak of 35mm, using folding machine or universal flat-nosed pliers. The angle at the base of the 45mm turn-up is greater than 90 degrees to allow for lateral movement in the copper sheet.

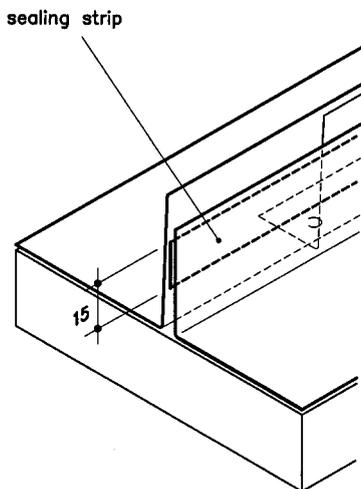


Fig 1c Sealing strip for pitches below 6degrees

TRADITIONAL ✓ LONG STRIP ✓

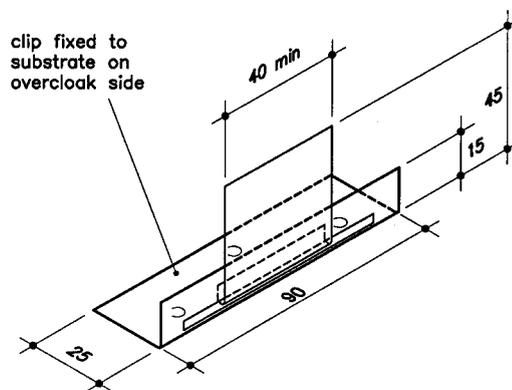
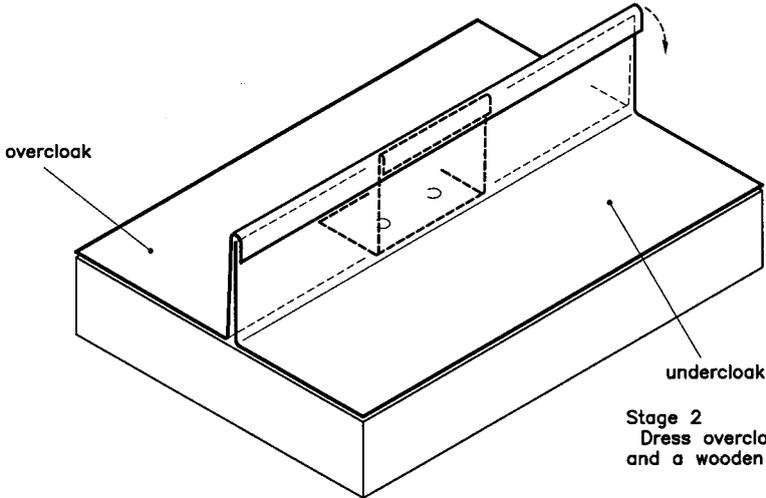


Fig 1b Sliding clip

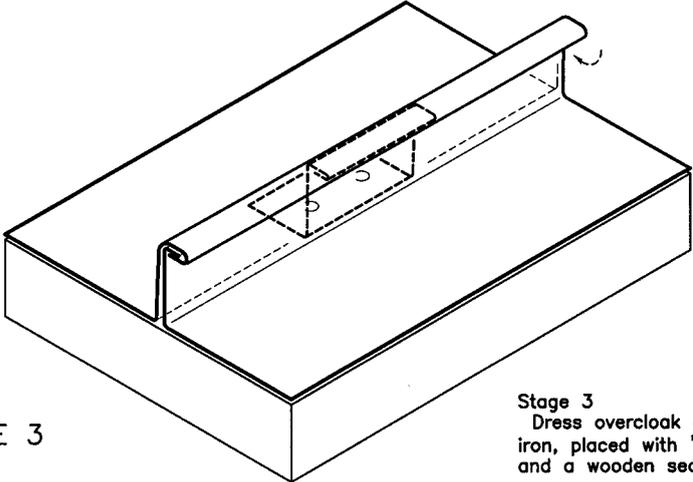
TRADITIONAL X LONG STRIP ✓

* For spacing and positioning of clips, see Table L (p11).



Stage 2
Dress overcloak over and down using a seaming iron and a wooden seaming mallet.

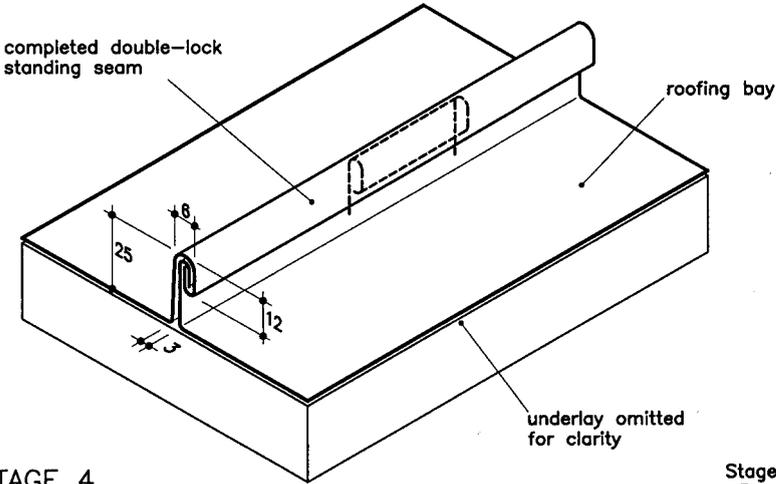
STAGE 2



Stage 3
Dress overcloak and undercloak over using a seaming iron, placed with 'second turn' iron against undercloak, and a wooden seaming mallet.

STAGE 3

This is the final stage for the Angle standing seam. Note it can only be used at and over 25degrees roof pitch.



Stage 4
Dress seam down to complete the joint.

STAGE 4

Fig 2 Roll-formed profiled trays

This is the most efficient method of forming standing seams and is therefore used wherever possible. It gives a very consistent and precise appearance to the seam. As seaming machines can work up to the vertical, this quality can be achieved in cladding as well as roofing.

For cladding, horizontal seams are also possible (see Fig 24a) with, of course, the welt turned to the underside of the seam. The 'angle standing seam', which is simply with the seam completed at Stage 2, is often used in cladding because there tends to be less localised distortion or quilting effect to the copper sheet.

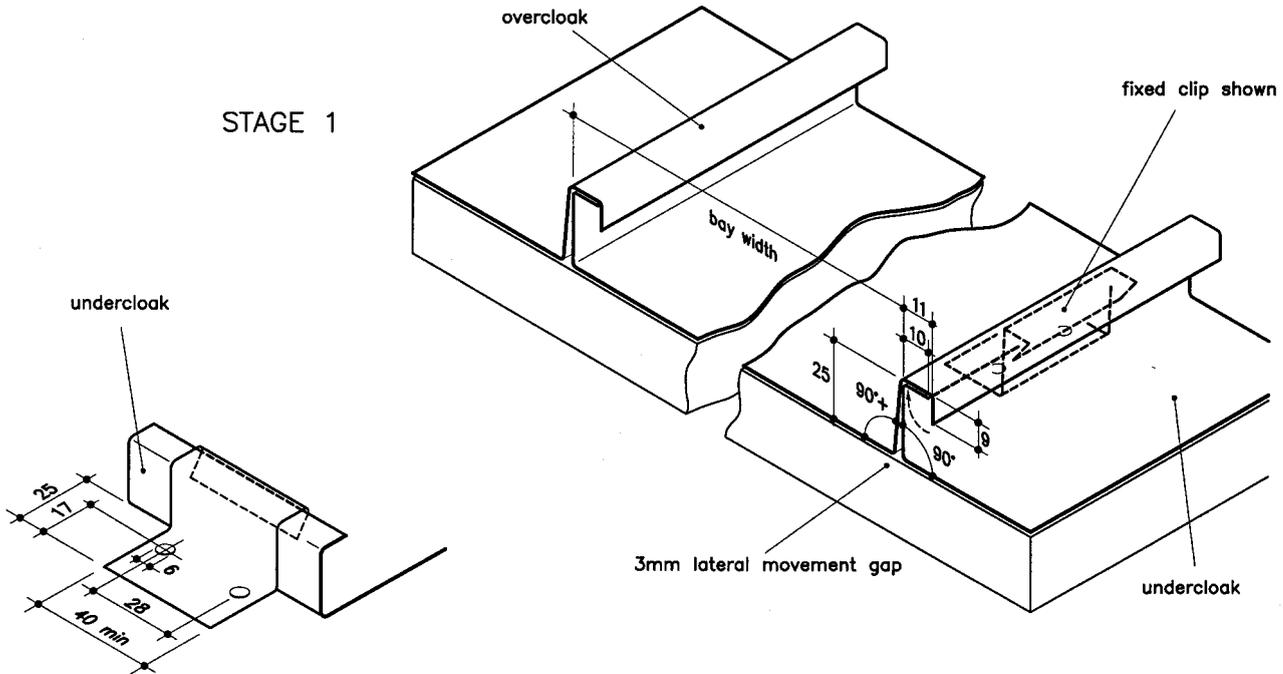
In roofing its minimum pitch unsealed is 6degrees. With a closed cell sealing strip such as Illmod, pitches down to 3degrees are possible, depending on exposure. Whether to seal or not should be discussed with the copper roofer. The angle standing seam can only be used at and over 25degrees roof pitch.

For bay widths taken from seam centre to seam centre, see Table E (p8) and J (p10). Also see Tables M and N (p12).

Temper: half-hard
Thickness: 0.6mm or 0.7mm

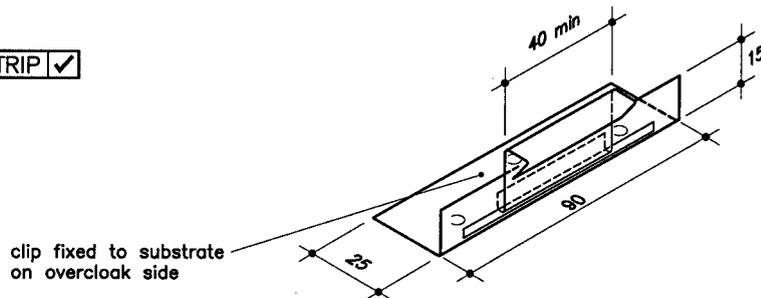
TRADITIONAL ✓ LONG STRIP ✓

Stage 1
Preform tray in the workshop using a profiling machine. This automatically forms the 3mm gap needed to allow for lateral movement in the copper sheet.



- * Minimum dimensions shown. Clips are more often 50mm wide.
- * In most detail locations clips are spaced at 300mm centres, but see also Table L (p11)

Fig 2b Fixed clip
TRADITIONAL ✓ LONG STRIP ✓



* For spacing and positioning of clips, see Table L (p11).

Fig 2c Sliding clip
TRADITIONAL X LONG STRIP ✓

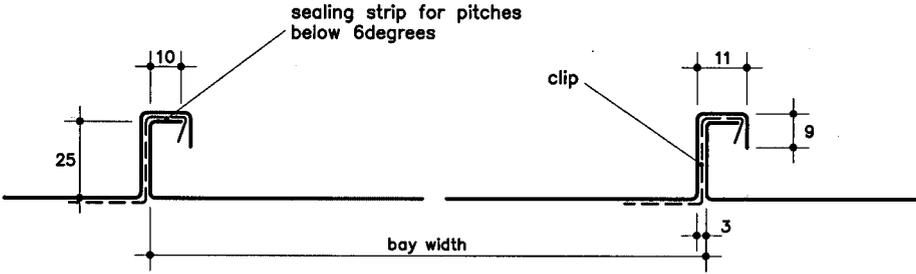
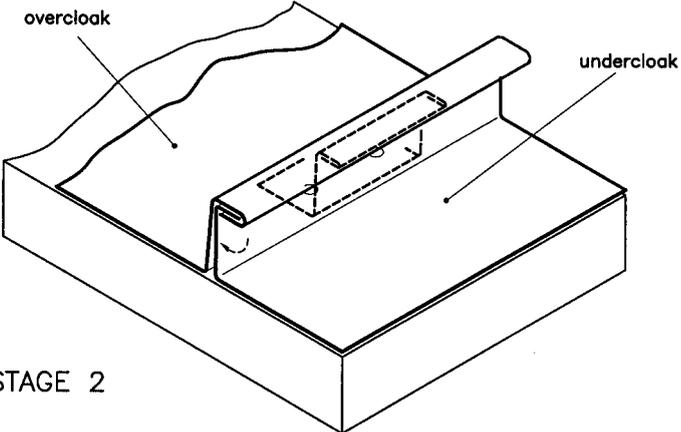


Fig 2a Section across tray
 TRADITIONAL ✓ LONG STRIP ✓

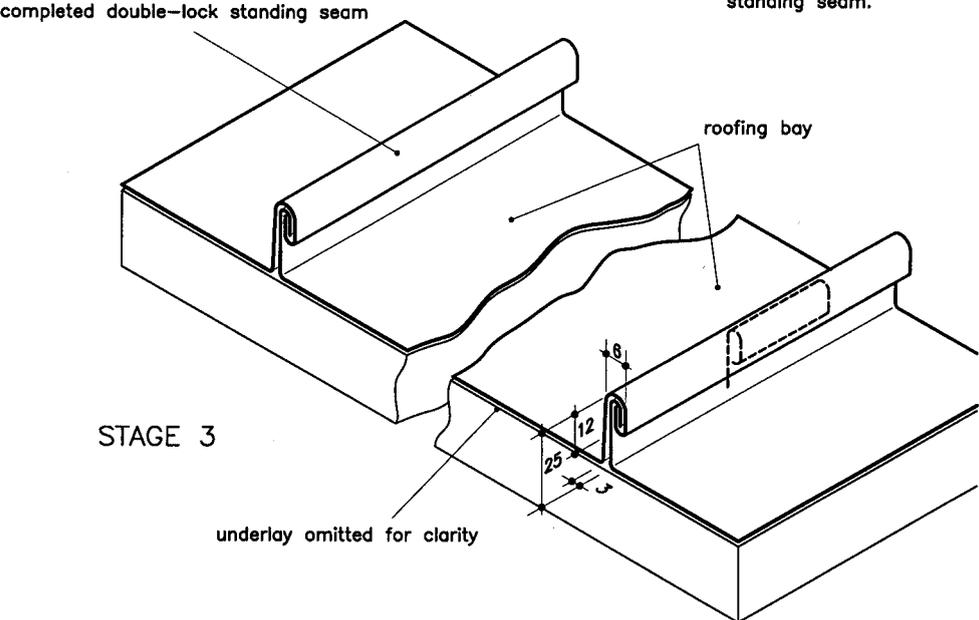


STAGE 2

Stage 2
 For Traditional roofing a seaming machine is not possible as it cannot run over the cross welts. Instead a hand-operated angle seamer is used, followed by a double seamer to complete Stage 3.

With Long Strip roofing the bottom 300mm run of the seam is formed using hand-operated seamers. This provides a guide for the seaming machine.

This is the final stage for the Angle standing seam.



STAGE 3

Stage 3
 Place the seaming machine at the bottom of the run and work up the seam. This completes the standing seam.

Fig 3 Turned-down standing seam end

This seam is only possible in Traditional roofing. The form illustrated is using the so-called 'English method'. In the alternative 'European method' the seam is turned over the other way so that the welt in the seam faces uppermost. This allows water to drain out of the welt more effectively.

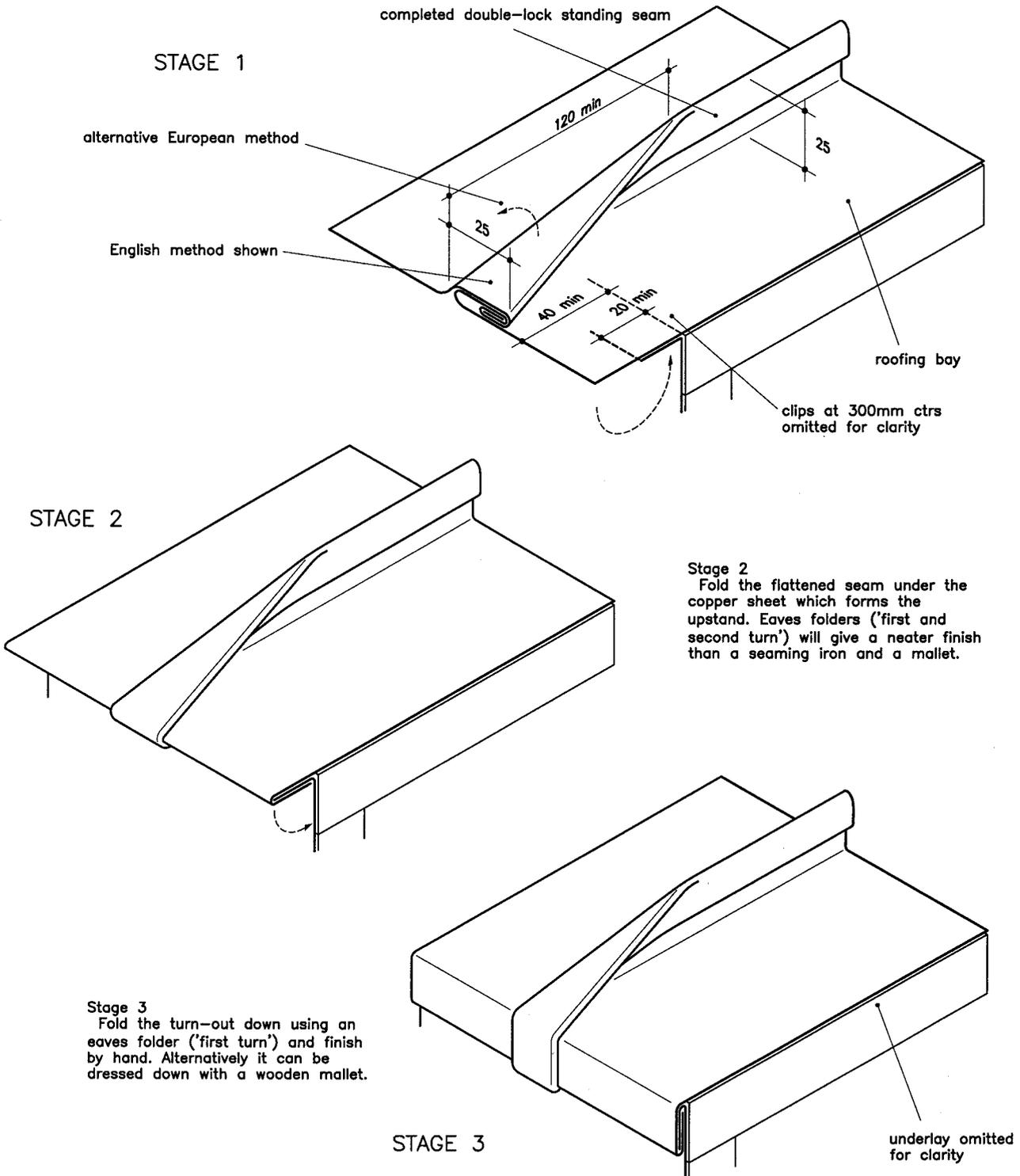
Temper: soft or quarter-hard, preferably. If half-hard is used the sides of the copper sheet should be cut tapered 10mm maximum, to the start of the splay.

Thickness: 0.6mm or 0.7mm

Stage 1

Dress standing seam over using a wooden seaming mallet. When flattening the end support the seam from underneath with a seaming iron. The start of the splay should be 120mm minimum from the edge of the copper sheet. Otherwise it is very difficult to carry out Stage 2 without the copper bunching up. It also puts the copper under less stress.

TRADITIONAL LONG STRIP



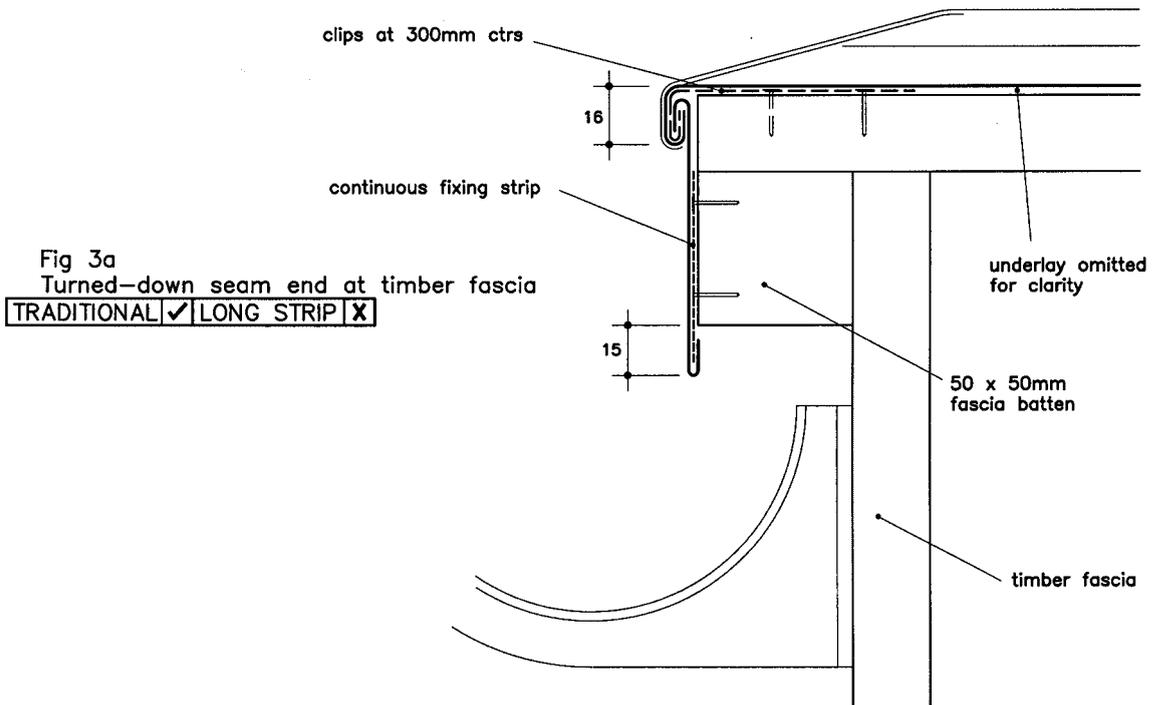


Fig 3a
Turned-down seam end at timber fascia
TRADITIONAL ✓ LONG STRIP X

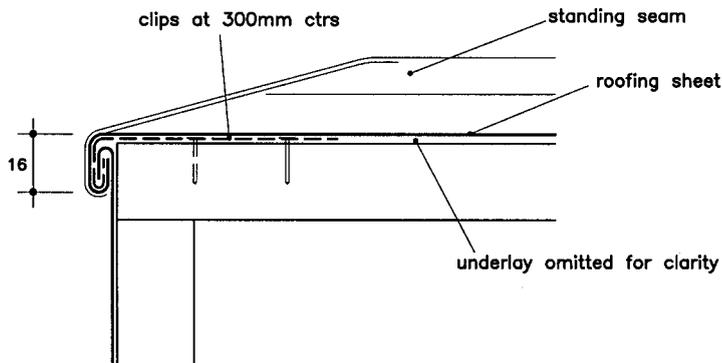


Fig 3b
Turned-down seam end at parapet gutter
TRADITIONAL ✓ LONG STRIP X

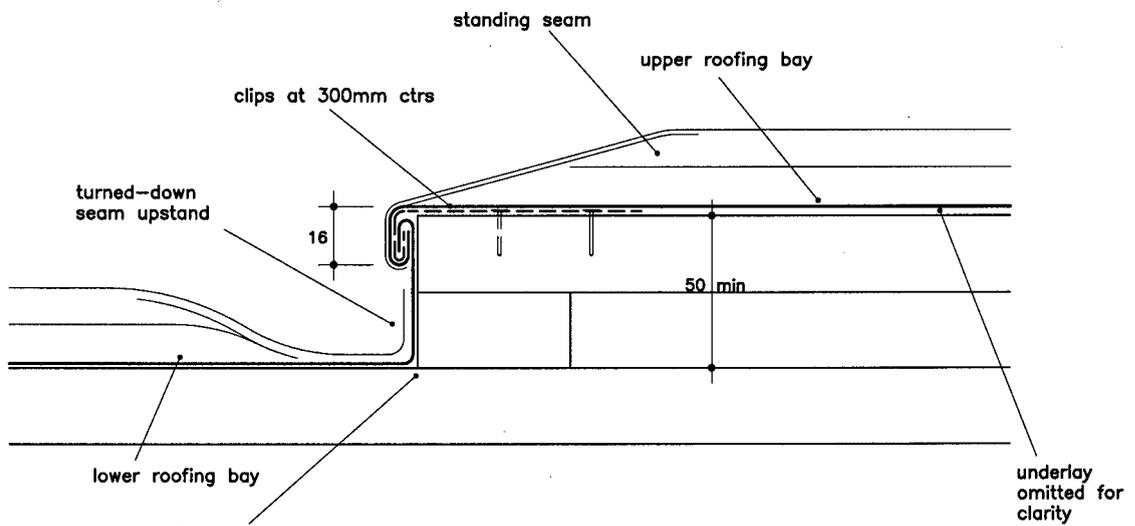


Fig 3c
Turned-down seam end at drip-step
TRADITIONAL ✓ LONG STRIP X

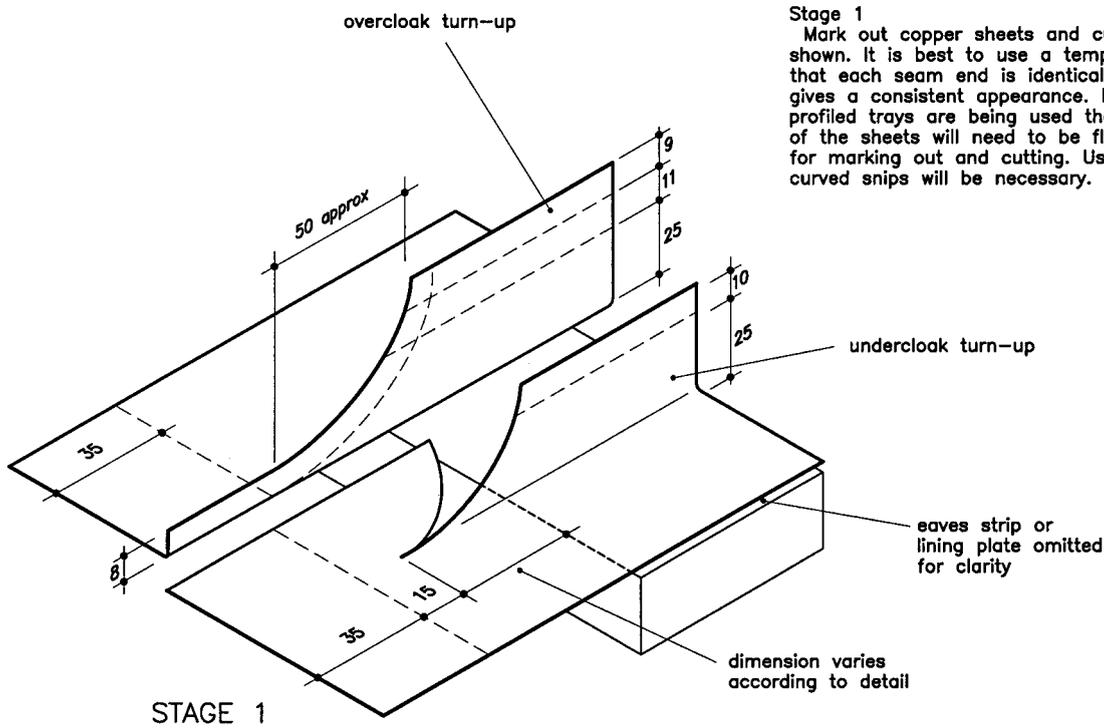
This is the preferred method of finishing a seam end. The Chamfer-form and the Square-form seam ends (see Figs 5 and 6) are alternatives. It can be used to end angle standing seams in roofing. Also to end double-lock standing seams or angle standing seams in cladding.

The detail on its own is not weathertight. It also needs an eaves strip or lining plate underneath it, extending 130mm minimum up the roof slope (see Figs 26 and 28). This is shown on the accompanying details (see Figs 4a, 4b, 4c, 4d, 4e and 4f). Joints in eaves strips or lining plates are either 150mm lapped joints or, more usually and preferably, 50mm lapped and sealed. They must be positioned at least 150mm from standing seams, but a convenient rule is to make such joints mid-bay.

The eaves strip or lining plate should project sufficiently, so that the turn-under of the roofing sheet can engage it by 20mm and still have 10mm for movement. In Traditional roofing the 10mm movement gap is not required. In effect, in Long Strip roofing the roofing sheets are cut 40mm beyond the end of the eaves strip; and in Traditional roofing 20mm beyond.

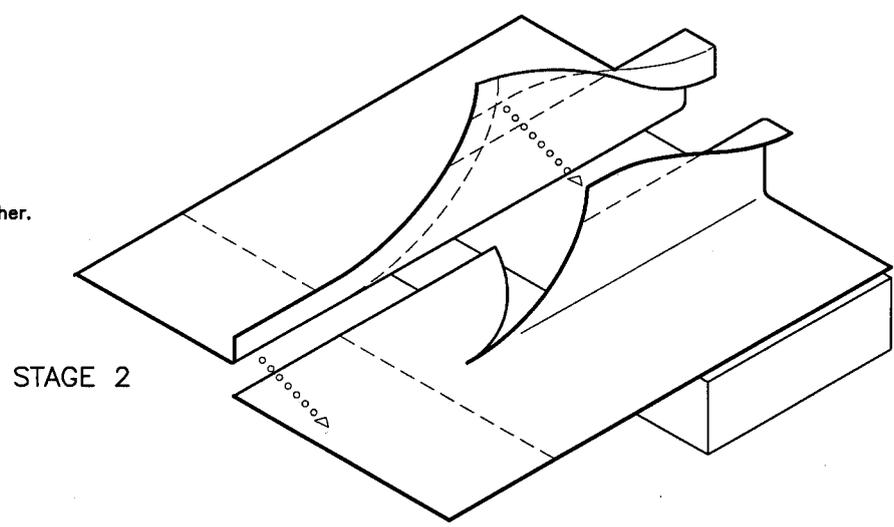
Temper: half-hard preferably, although it does take more working at Stage 3 than softer copper.
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓



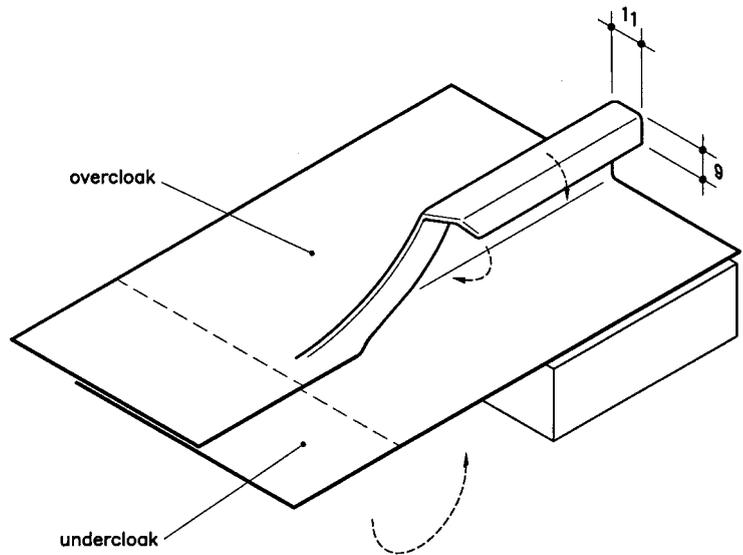
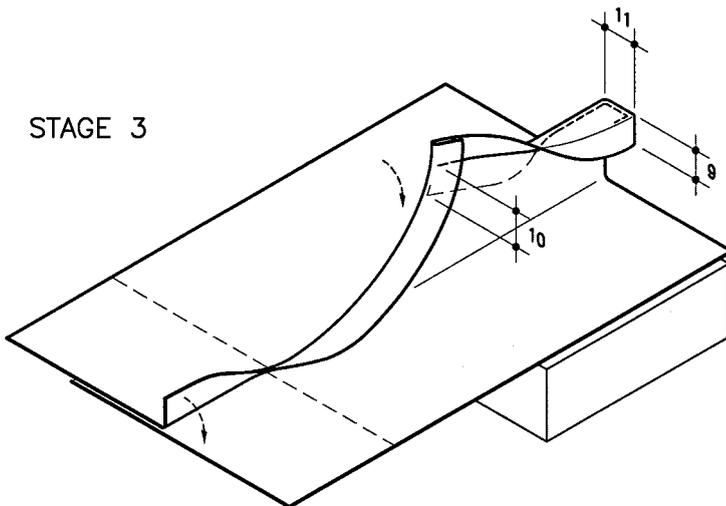
Stage 1
Mark out copper sheets and cut as shown. It is best to use a template so that each seam end is identical. This gives a consistent appearance. If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use of curved snips will be necessary.

Stage 2
Bring copper sheets together.



Stage 4

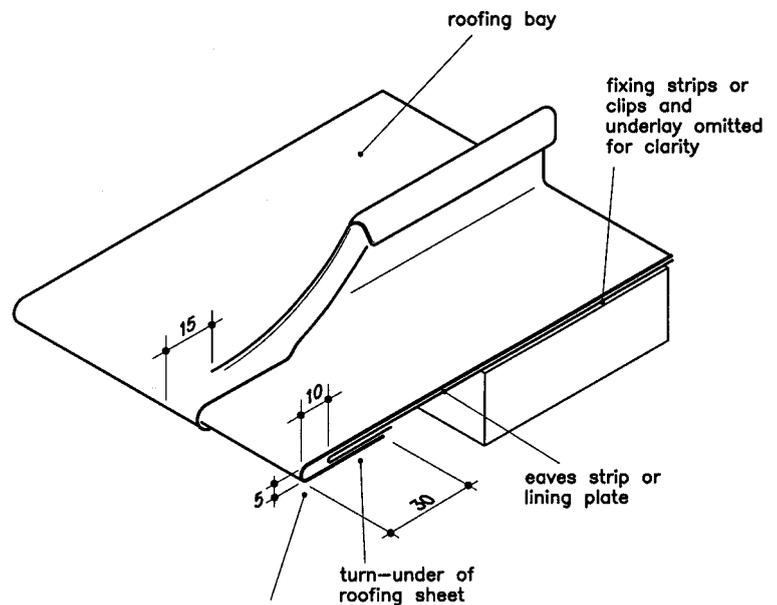
Fold the standing seam copper over to regain the shape of the profiled tray, flattened out for Stage 1. Then fold the 9mm turn-down of the overcloak around the 10mm turn-out of the undercloak, using cranked seaming pliers.

STAGE 4**STAGE 3****Stage 3**

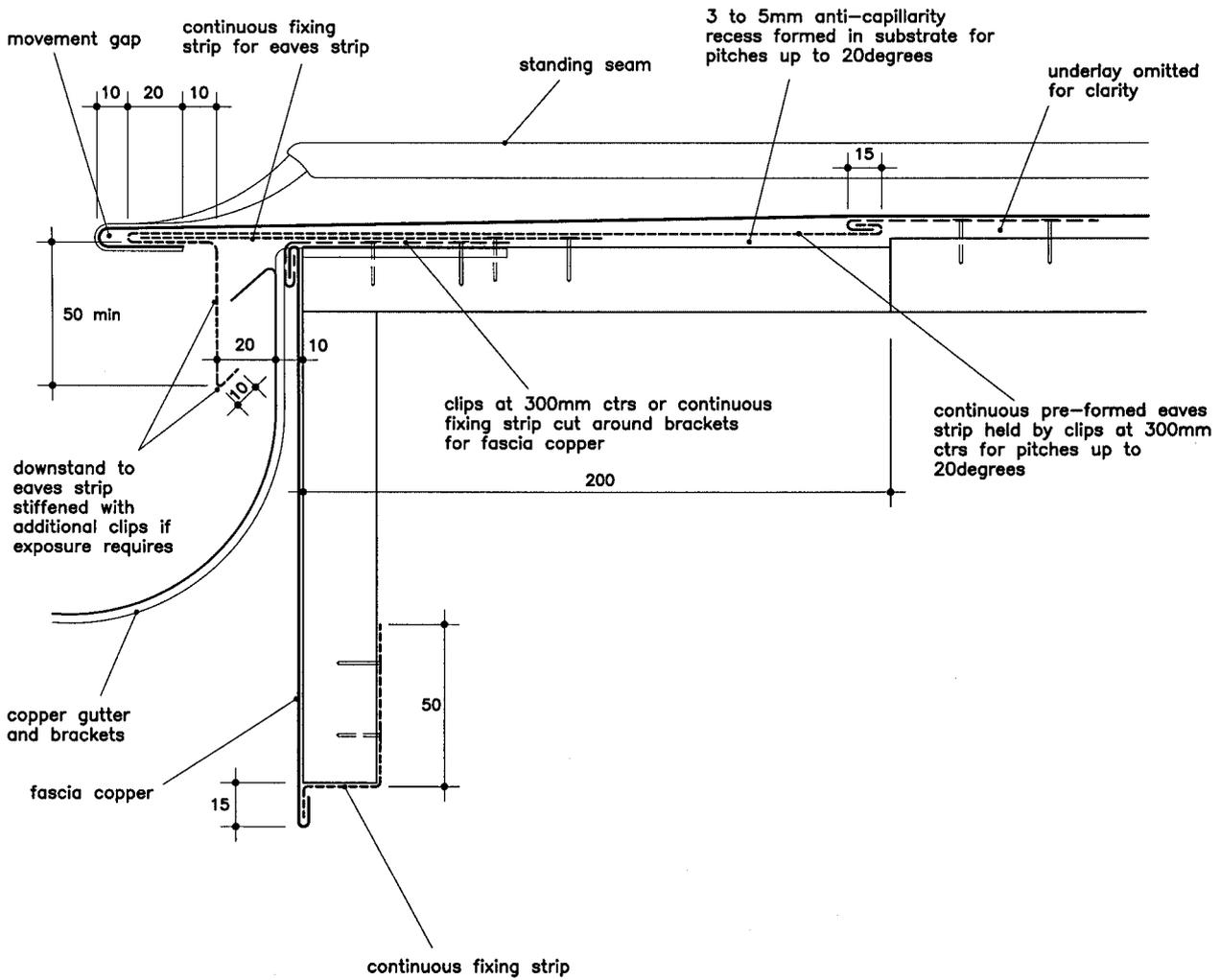
Work overcloak at curve over undercloak using a small mallet. The overcloak is then flattened back against the undercloak which is supported by a seaming iron.

STAGE 5**Stage 5**

Dress seam down to complete the joint. Then fold the ends, now united, of the copper sheets around the projecting eaves strip or lining plate, according to detail. This will have been nailed in place beforehand. Eaves folders ('first and second turn') should be used. In Long Strip roofing a 10mm gap is left for movement.



10mm movement gap
in Long Strip



* Fascia copper can be simply nailed at the top edge as an alternative to clips.

Fig 4a
Seam end at copper clad fascia

| | | | |
|-------------|---|------------|---|
| TRADITIONAL | ✓ | LONG STRIP | ✓ |
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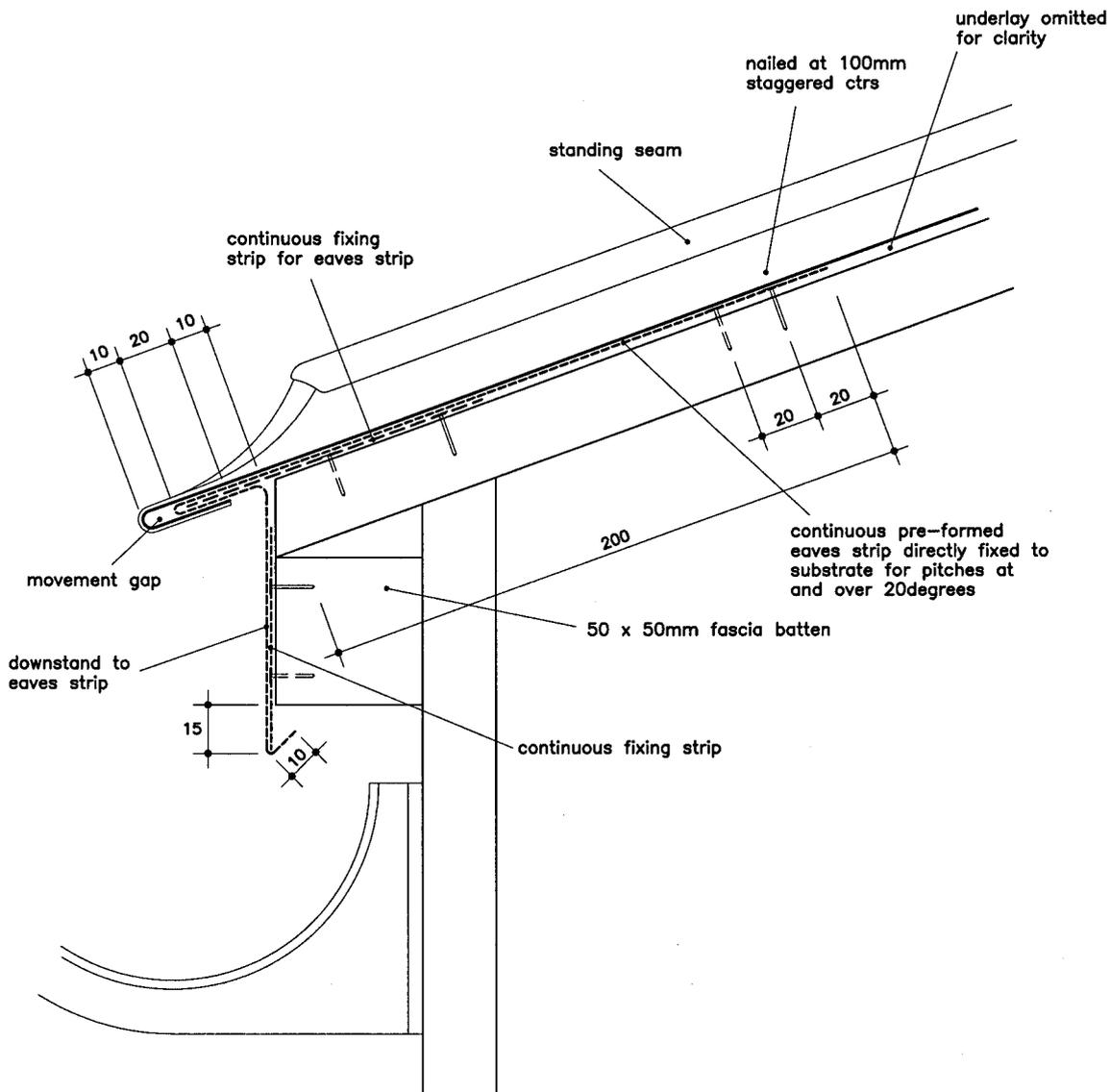


Fig 4b
 Seam end at timber fascia
 TRADITIONAL LONG STRIP

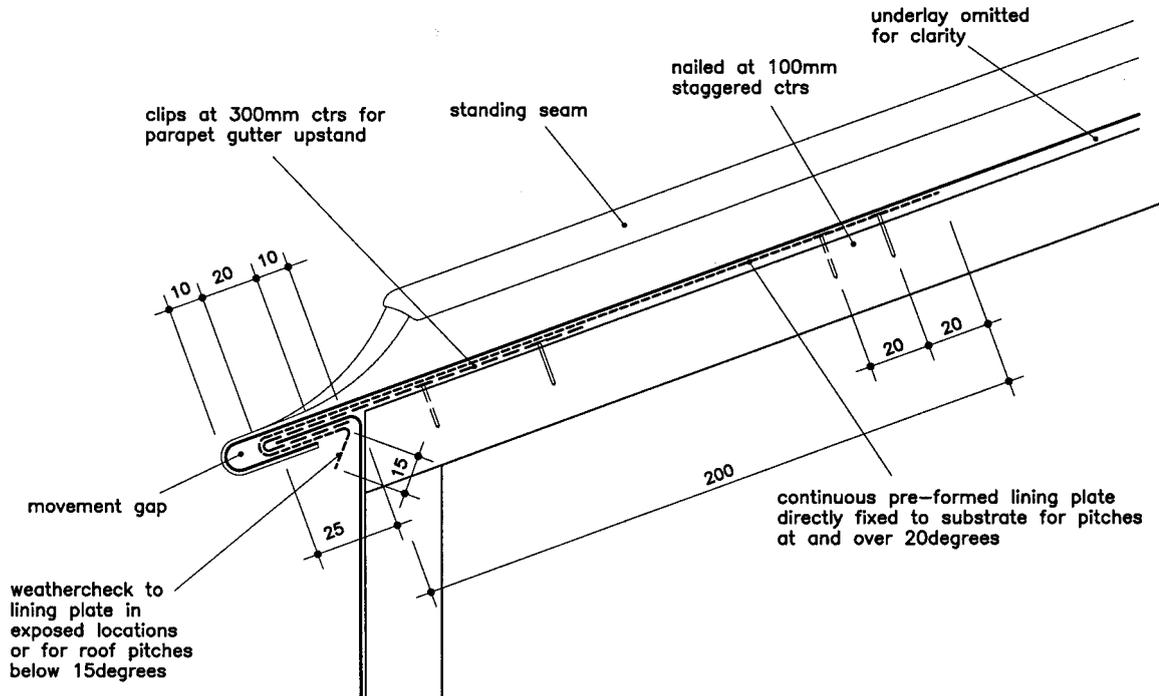


Fig 4c
Seam end at parapet gutter showing weathercheck to lining plate
TRADITIONAL LONG STRIP

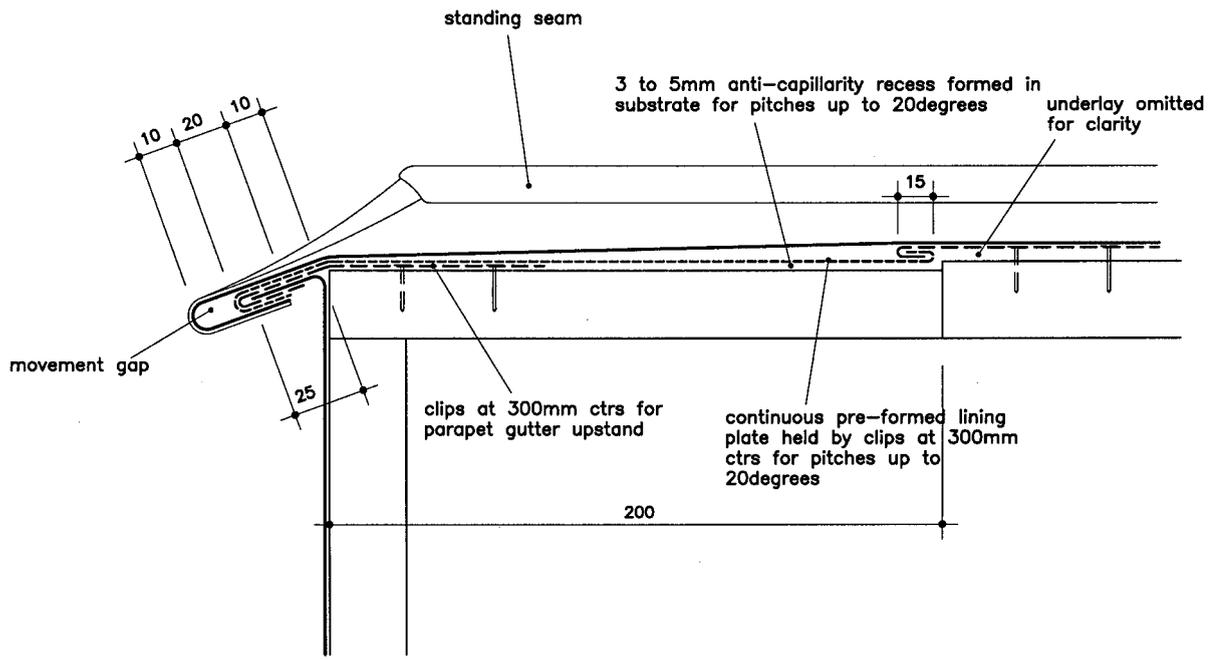
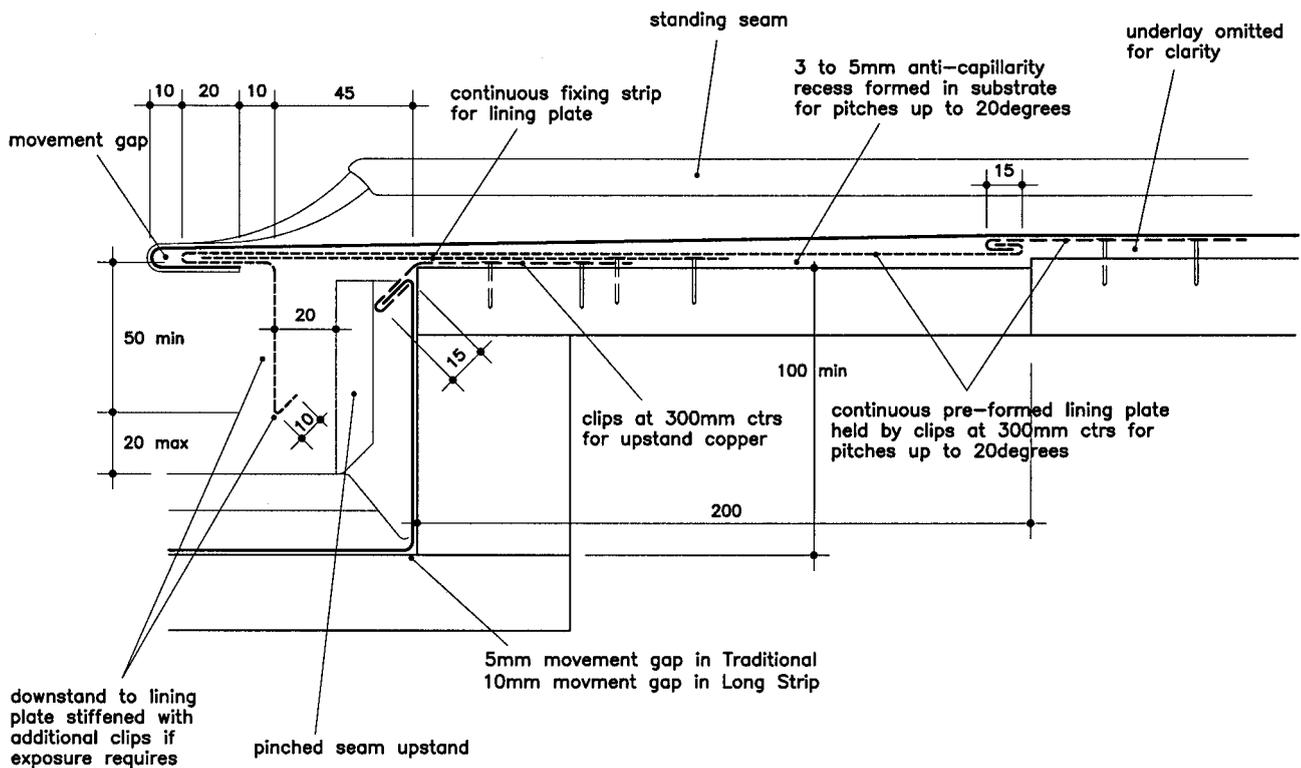
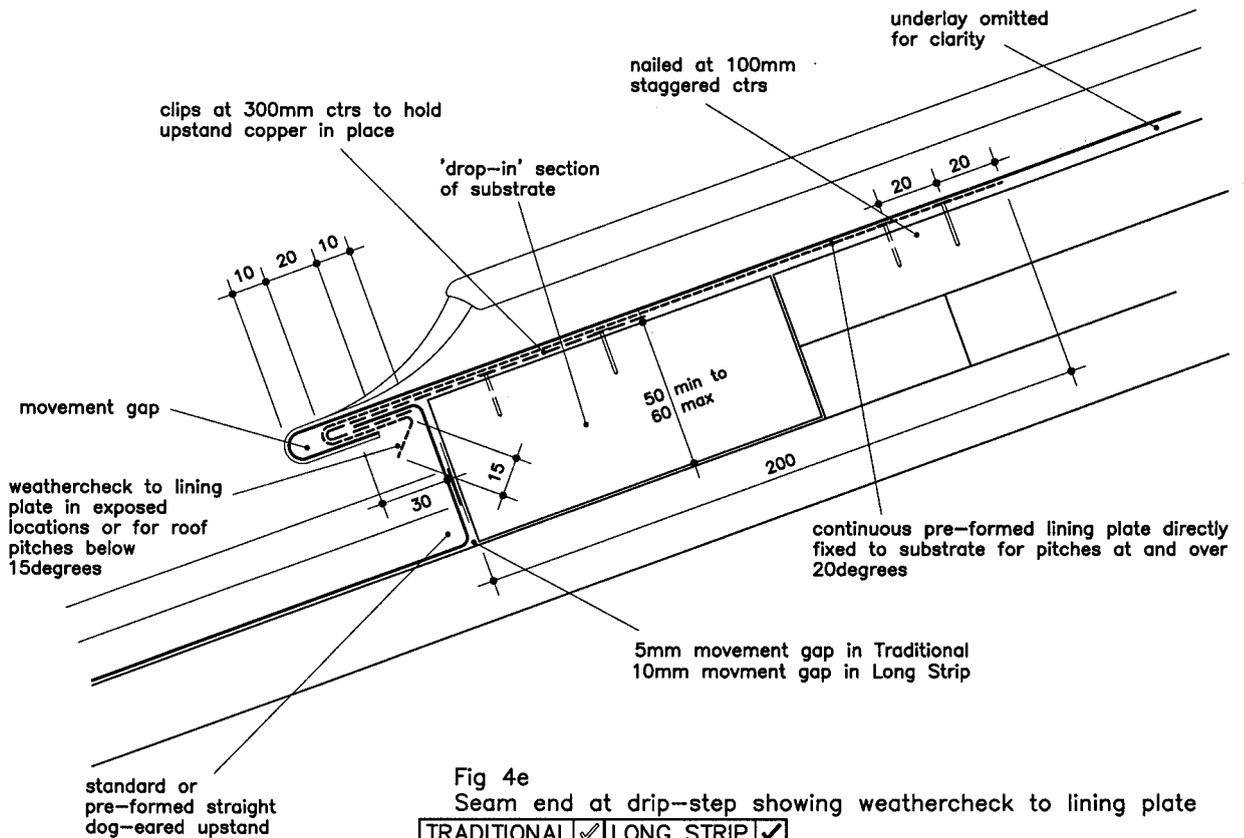


Fig 4d
Seam end at parapet gutter showing tilted edge
TRADITIONAL LONG STRIP



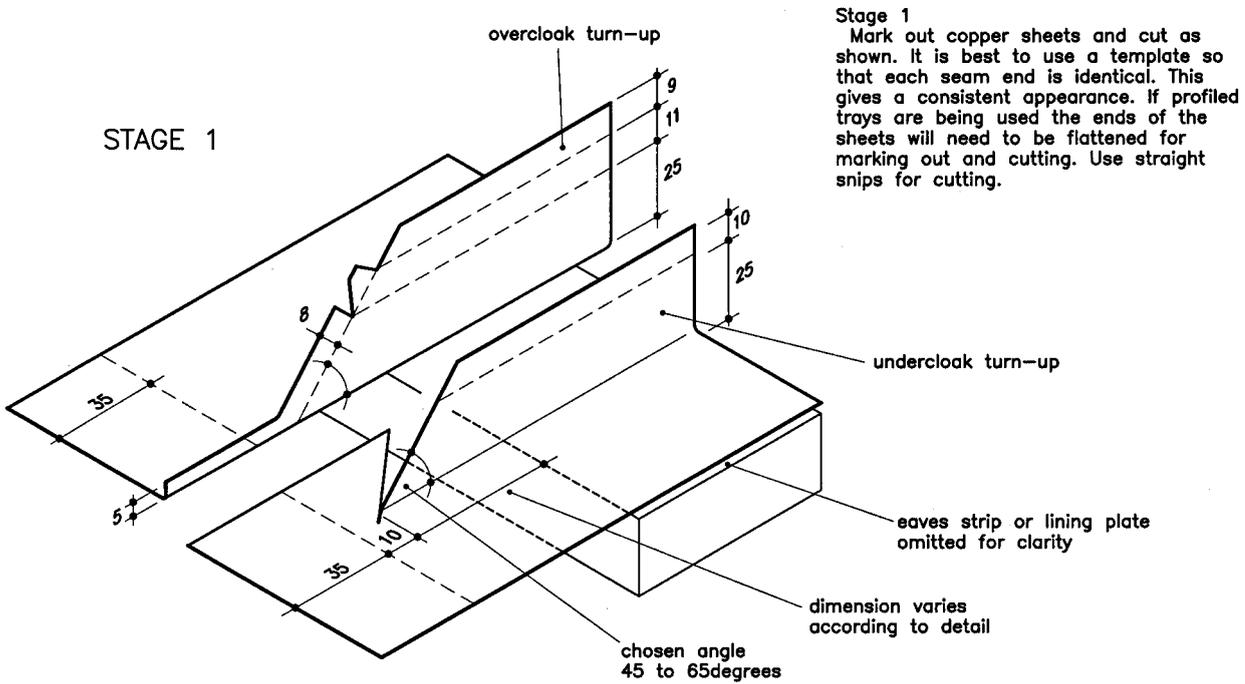
This is sometimes referred to as a 'splayed edge seam end'. The Concave-form and the Square-form seam ends (see Figs 4 and 6) are alternatives. It can be used to end angle standing seams in roofing. Also to end double-lock standing seams or angle standing seams in cladding.

The detail on its own is not weathertight. It also needs an eaves strip or lining plate underneath it, extending 130mm minimum up the roof slope (see Figs 26 and 28). This is shown on the preceding details (see Figs 4a, 4b, 4c, 4d, 4e and 4f). Joints in eaves strips or lining plates are either 150mm lapped joints or, more usually and preferably, 50mm lapped and sealed. They must be positioned at least 150mm from standing seams, but a convenient rule is to make such joints mid-bay.

The eaves strip or lining plate should project sufficiently, so that the turn-under of the roofing sheet can engage it by 20mm and still have 10mm for movement. In Traditional roofing the 10mm movement gap is not required. In effect, in Long Strip roofing the roofing sheets are cut 40mm beyond the end of the eaves strip; and in Traditional roofing 20mm beyond.

Temper: half-hard preferably, although it does take more working at Stage 3 than softer copper.
Thickness: 0.6mm or 0.7mm

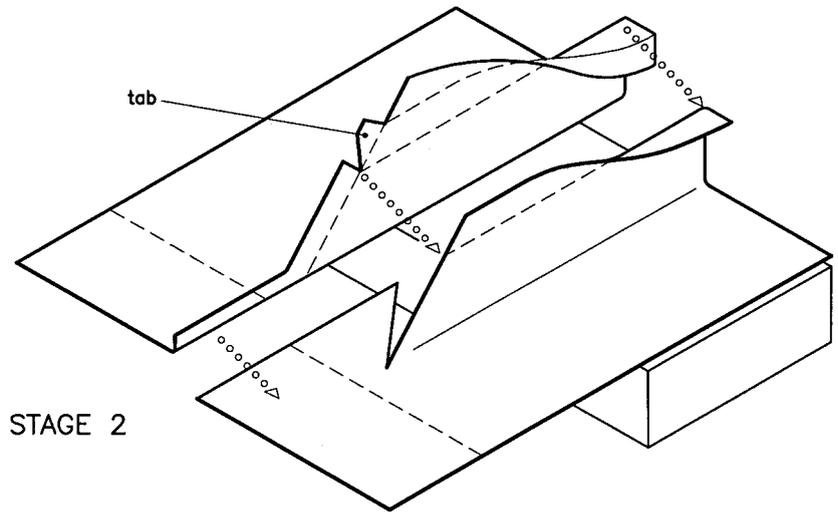
TRADITIONAL ✓ LONG STRIP ✓



Stage 1
Mark out copper sheets and cut as shown. It is best to use a template so that each seam end is identical. This gives a consistent appearance. If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use straight snips for cutting.

STAGE 1

Stage 2
Bring copper sheets together.

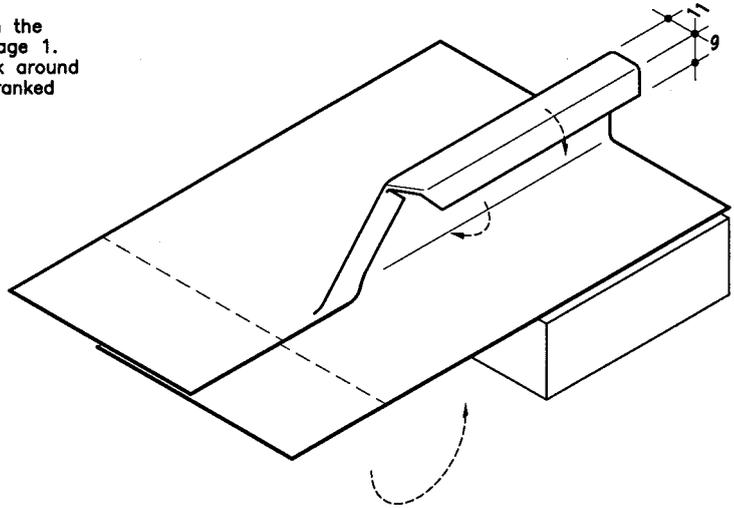


STAGE 2

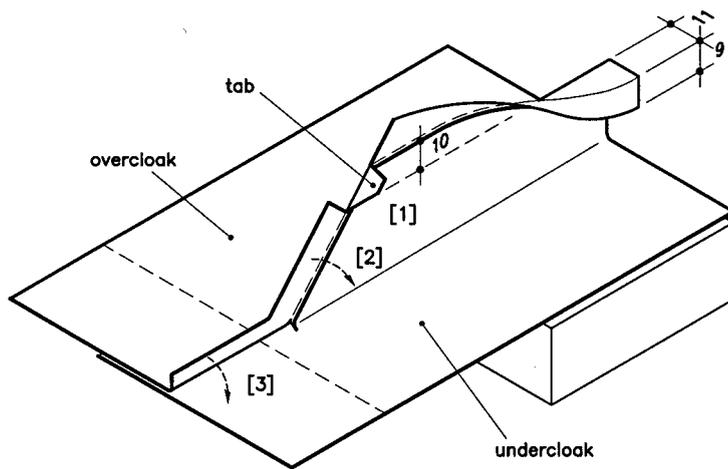
Stage 4

Fold the standing seam copper over to regain the shape of the profiled tray, flattened out for Stage 1. Then fold the 9mm turn-down of the overcloak around the 10mm turn-out of the undercloak using cranked seaming pliers.

STAGE 4



STAGE 3

**Stage 3**

Tuck the tab [1] at the top of the seam around the end of the undercloak. Work overcloak at the chamfer over undercloak [2] using a small mallet. The overcloak is then flattened back against the undercloak [3] which is supported by a seaming iron.

STAGE 5

Stage 5

Dress seam down to complete the joint. Then fold the ends, now united, of the copper sheets around the projecting eaves strip or lining plate, according to detail. This will have been nailed in place beforehand. Eaves folders ('first and second turn') should be used. In Long Strip roofing a 10mm gap is left for movement.

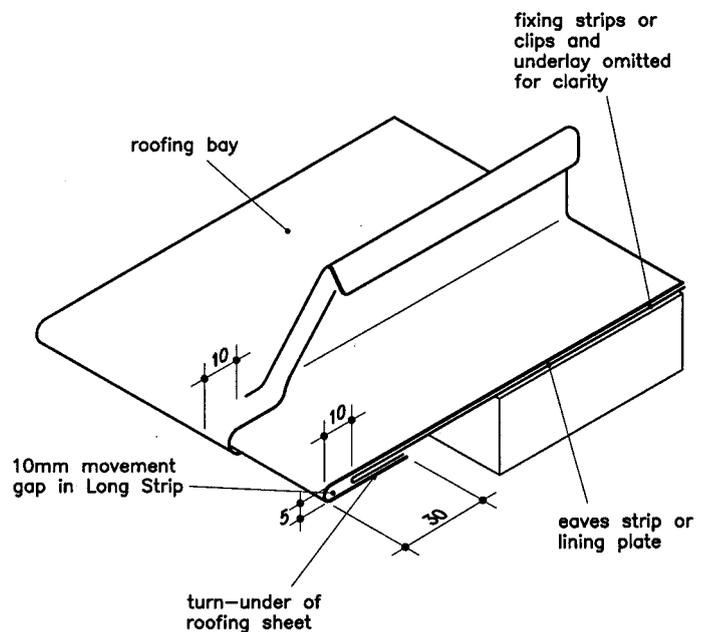


Fig 6 Square-form seam end

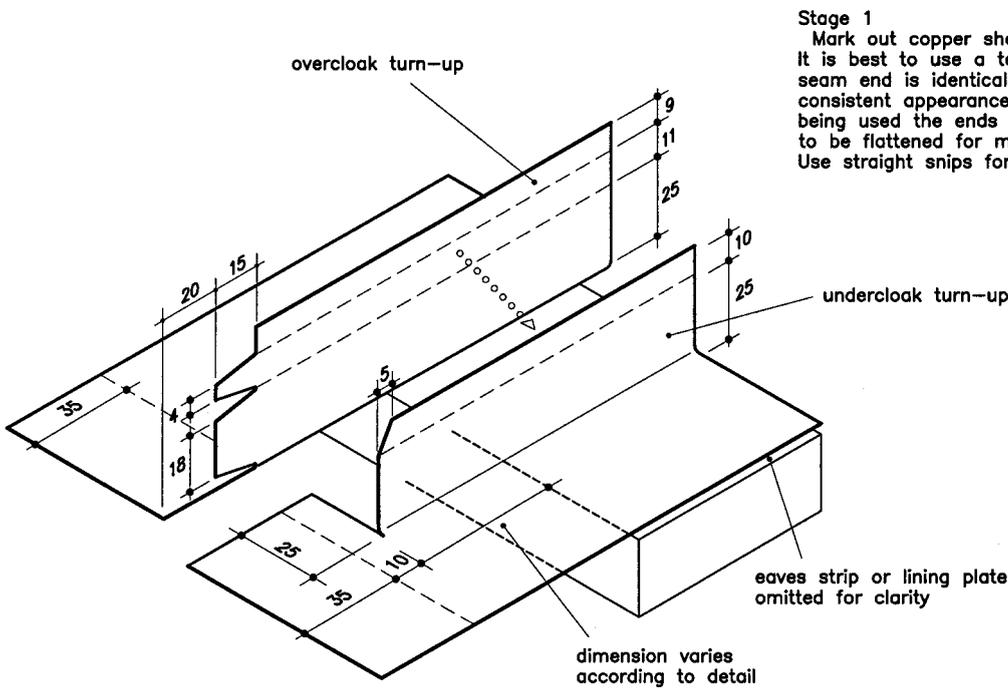
This seam end is the least preferred due to the small hole which occurs at the top of the seam at the very end. This has no effect on its weathertightness because eaves strips or lining plates are always to be provided. It is a matter of appearance. The Concave-form and the Chamfer-form seam ends (see Figs 4 and 5) are alternatives. It can be used to end angle standing seams in roofing. Also to end double-lock standing seams or angle standing seams in cladding.

The detail on its own is not weathertight. It also needs an eaves strip or lining plate underneath it, extending 130mm minimum up the roof slope (see Figs 26 and 28). This is shown on the preceding details (see Figs 4a, 4b, 4c, 4d, 4e and 4f). Joints in eaves strips or lining plates are either 150mm lapped joints or, more usually and preferably, 50mm lapped and sealed. They must be positioned at least 150mm from standing seams but a convenient rule is to make each joint mid-bay.

The eaves strip or lining plate should project sufficiently, so that the turn-under of the roofing sheet can engage it by 20mm and still have 10mm for movement. In Traditional roofing the 10mm movement gap is not required. In effect, in Long Strip roofing the roofing sheets are cut 40mm beyond the end of the eaves strip; and in Traditional roofing 20mm beyond.

Temper: half-hard
Thickness: 0.6mm or 0.7mm

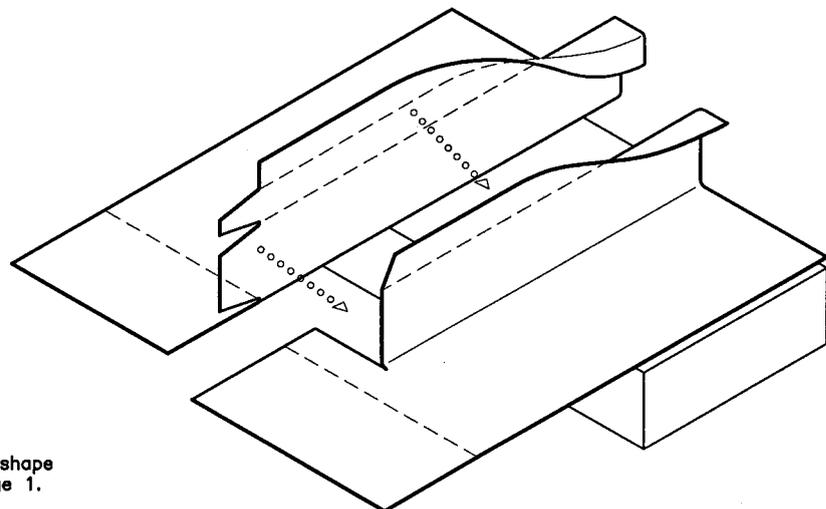
TRADITIONAL LONG STRIP



STAGE 1

Stage 1
Mark out copper sheets and cut as shown. It is best to use a template so that each seam end is identical. This gives a consistent appearance. If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use straight snips for cutting.

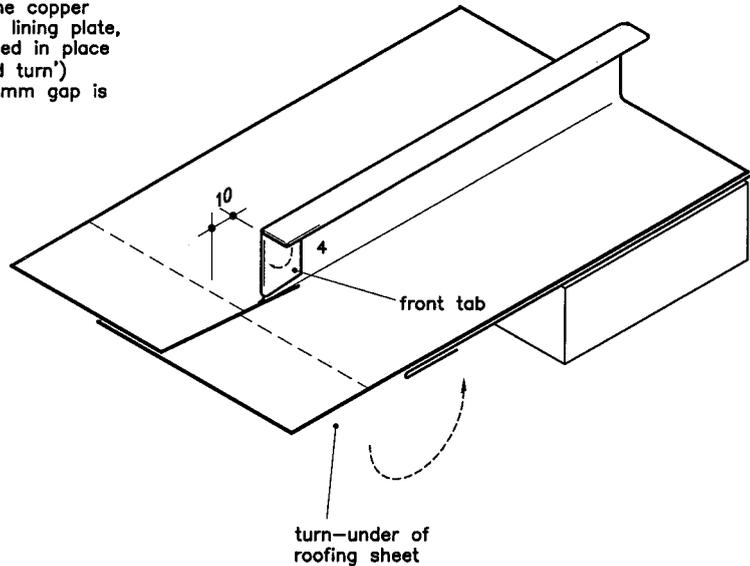
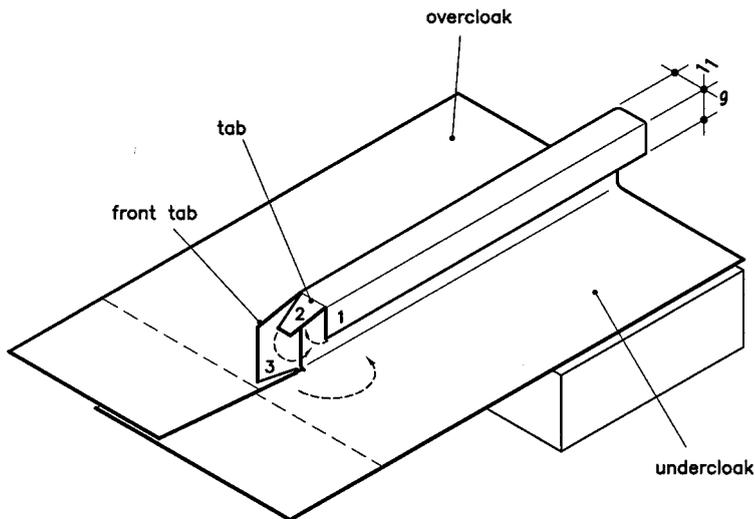
STAGE 2



Stage 2
Bring copper sheets together folding the standing seam copper over to regain the shape of the profiled tray, flattened out for Stage 1.

Stage 4

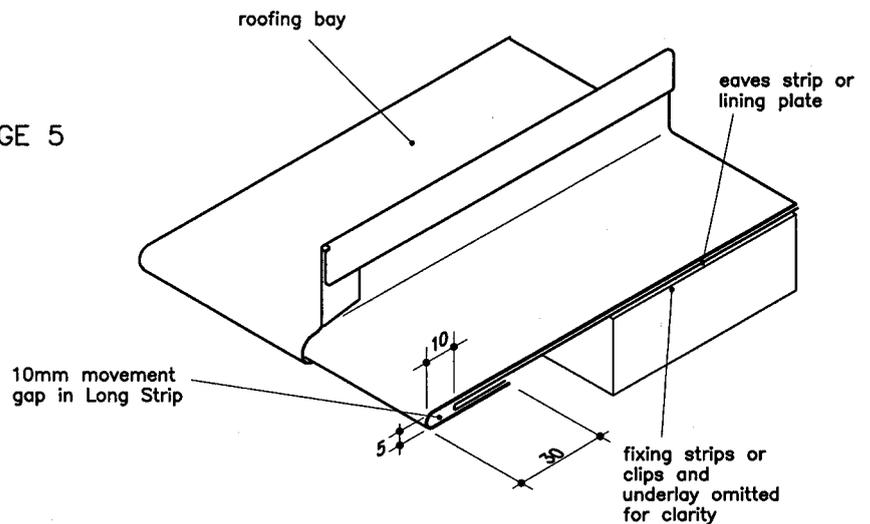
Dress turn-out of seam [4] down to complete the joint. Then fold the ends, now united, of the copper sheets around the projecting eaves strip or lining plate, according to detail. This will have been nailed in place beforehand. Eaves folders ('first and second turn') should be used. In Long Strip roofing a 10mm gap is left for movement.

STAGE 4**STAGE 3****Stage 3**

Fold the 9mm turn-down [1] of the overcloak around the 10mm turn-out of the undercloak using cranked seaming pliers. Tuck the tab [2] at the top of the seam around the end of the overcloak/undercloak. Then fold the front tab [3] around the end of the overcloak/undercloak.

STAGE 5**Stage 5**

The seam end is complete.



Although possible in theory this detail is rarely used for long bays, because, as can be seen from Stage 1, the sheet edges require cutting away for almost their entire length to form the sweep.

It is not easy to make the upstand less than 150mm. This means the detail can only be used for abutments (see Fig 7a). For lesser upstands and drip-steps the Pinched seam or Straight dog-eared upstands (see Figs 8 and 9) are preferred. These are generally easier and quicker to form.

Refer to Table E (p8) and J (p10) for bay widths. Forming the seam takes up about 125mm.

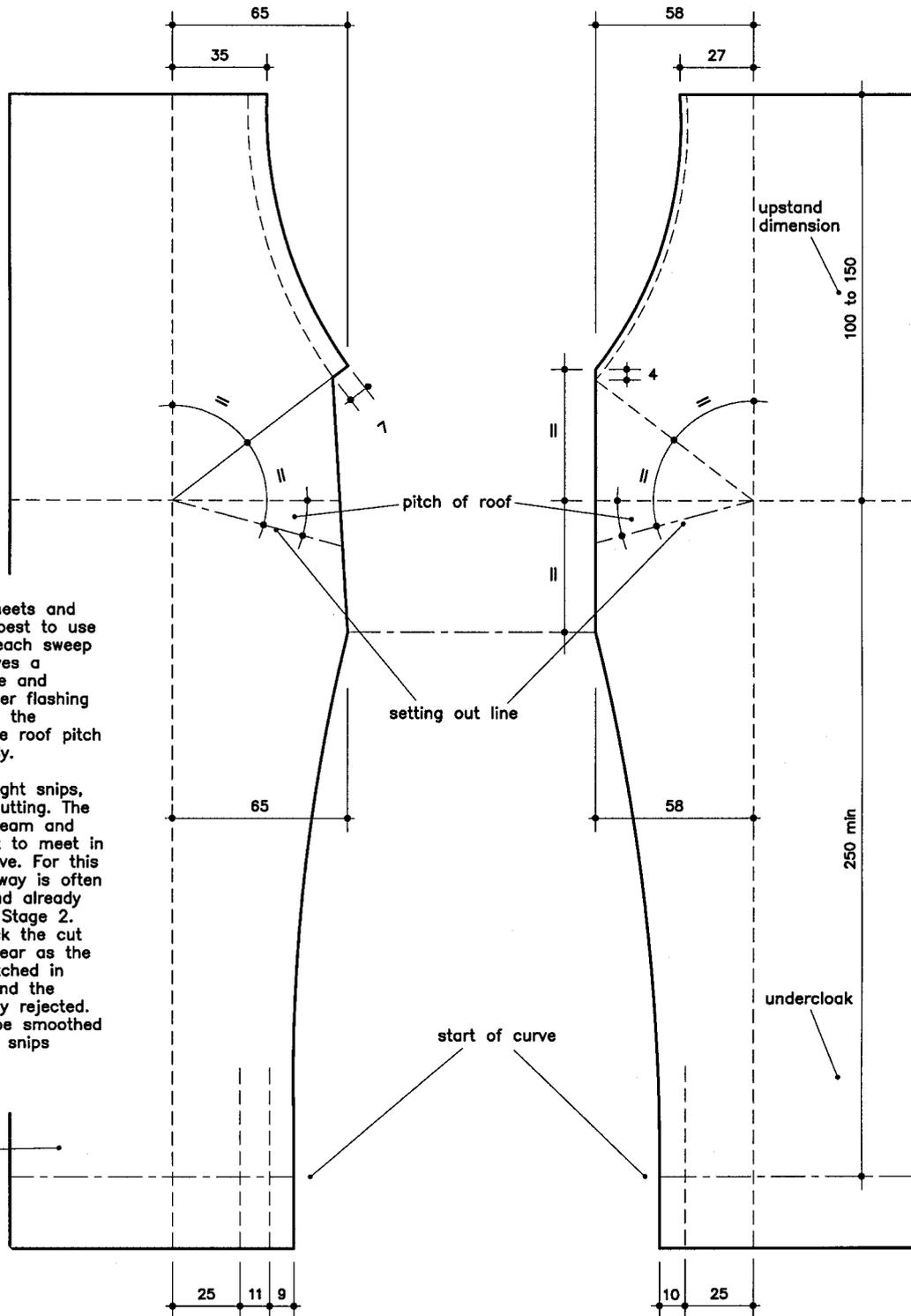
Old manuals show the upstand seam folded over. This restricts lateral movement and is no longer regarded as good practice in either Traditional or Long Strip roofing.

The Sweep standing seam should not be confused with the 'graduated standing seam' used at external corners (see Fig 18). Here only the undercloak is formed with a dog-ear fold. The overcloak is merely turned up and cut to a swept shape.

Temper: easier in soft or quarter-hard, but can be done in half-hard.
Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP

STAGE 1



Stage 1
Mark out copper sheets and cut as shown. It is best to use a template so that each sweep is identical. This gives a consistent appearance and ensures that the cover flashing fits neatly. Note that the marking out gives the roof pitch and varies accordingly.

Use curved or straight snips, as appropriate, for cutting. The separate curves of seam and upstand must be cut to meet in a single, smooth curve. For this reason the cutting away is often done with the upstand already folded upright, ie in Stage 2. Take care not to nick the cut edges. These could tear as the copper sheet is stretched in forming the detail, and the sheet be consequently rejected. The cut edges can be smoothed by running a pair of snips along.

overcloak

setting out line

pitch of roof

start of curve

undercloak

upstand dimension

100 to 150

250 min

65
35

58
27

65

58

25 11 9

10 25

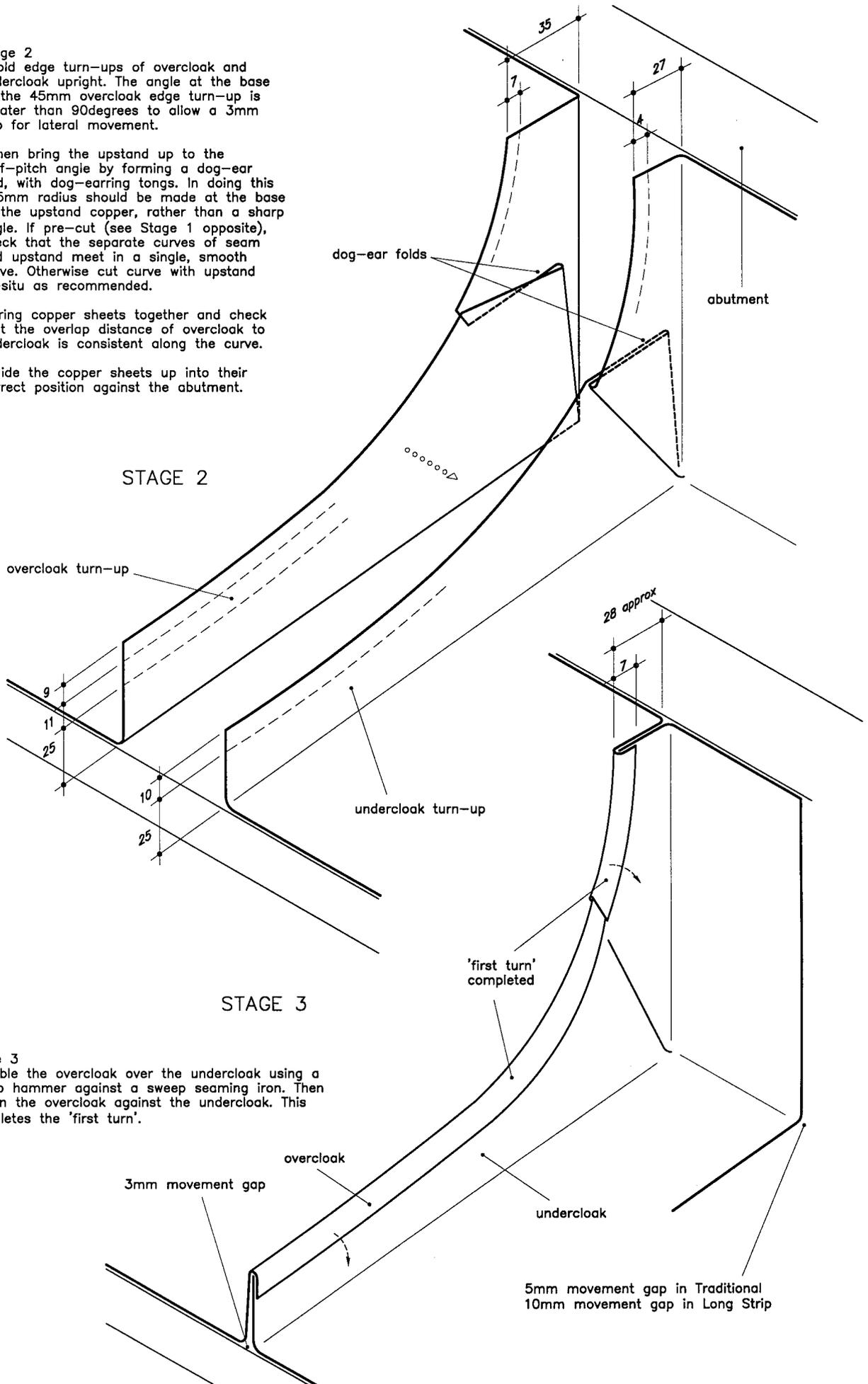
Stage 2

Fold edge turn-ups of overcloak and undercloak upright. The angle at the base of the 45mm overcloak edge turn-up is greater than 90degrees to allow a 3mm gap for lateral movement.

Then bring the upstand up to the roof-pitch angle by forming a dog-ear fold, with dog-earring tongs. In doing this a 5mm radius should be made at the base of the upstand copper, rather than a sharp angle. If pre-cut (see Stage 1 opposite), check that the separate curves of seam and upstand meet in a single, smooth curve. Otherwise cut curve with upstand in-situ as recommended.

Bring copper sheets together and check that the overlap distance of overcloak to undercloak is consistent along the curve.

Slide the copper sheets up into their correct position against the abutment.



STAGE 2

STAGE 3

Stage 3

Cobble the overcloak over the undercloak using a sweep hammer against a sweep seaming iron. Then flatten the overcloak against the undercloak. This completes the 'first turn'.

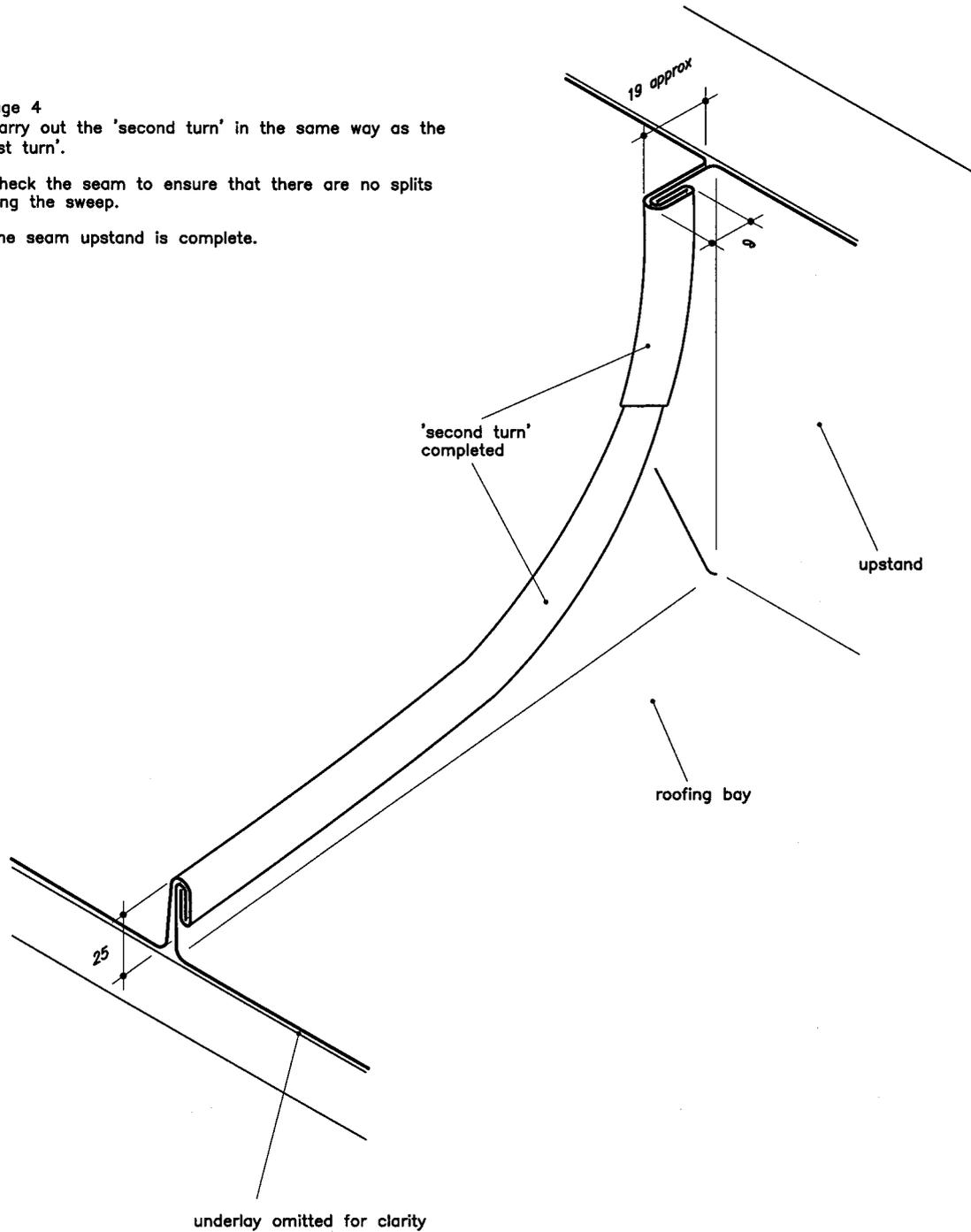
STAGE 4

Stage 4

Carry out the 'second turn' in the same way as the 'first turn'.

Check the seam to ensure that there are no splits along the sweep.

The seam upstand is complete.



- * The continuous fixing strip is fixed to the brickwork with 32mm No8 round head screws at 300mm centres, together with washers and plugged.
- * Joints in the continuous fixing strip are butt jointed.
- * Joints in cover flashing should be at 2m maximum centres. They can be made with lapped joints: either 150mm or 50mm with a check and sealed; or with single- or double-lock welts, according to exposure (see Figs 12b, 11a, 11b and 11c). Double-lock welts will be difficult to form in this situation and should be pre-formed.
- * The turn-up of the cover flashing engaging the fixing strip is cut away at 45degrees at joints in the run. Similarly at the check edge in the brick course.

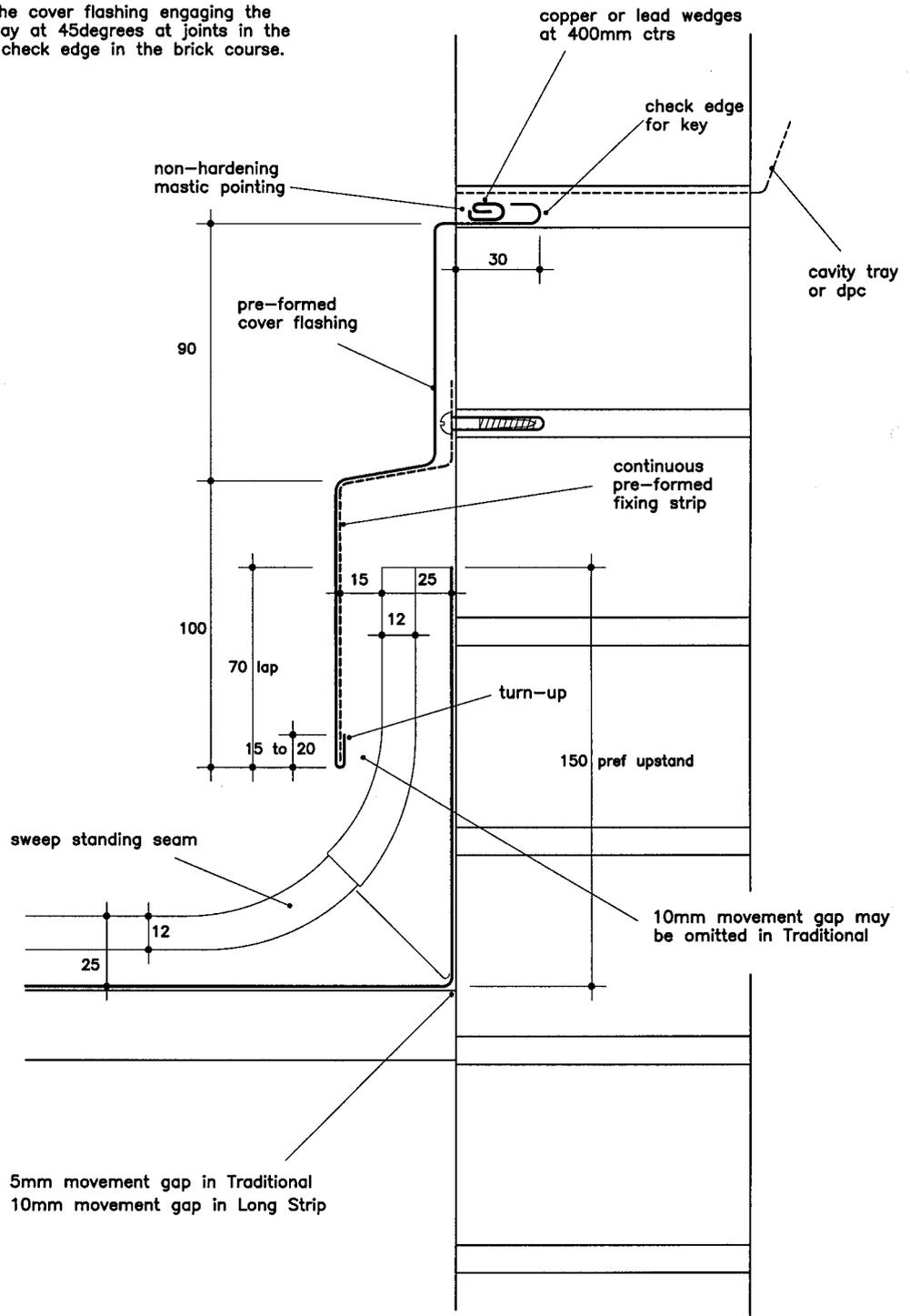


Fig 7a
Vertical upstand with horizontal
cover flashing to brickwork

TRADITIONAL ✓ LONG STRIP ✓

Fig 8 Pinched seam upstand

This is the preferred detail for abutments and ventilated ridges (see Figs 12, 13 and 20). It can also be used for drip-steps with a minimum upstand of 100mm (see Fig 4f). The maximum upstand height is only restricted by handling considerations, say 350mm.

TRADITIONAL ✓ LONG STRIP ✓

As all work to complete the joint can be done in-situ against the drip-step or abutment, it is an easily formed and therefore quick detail.

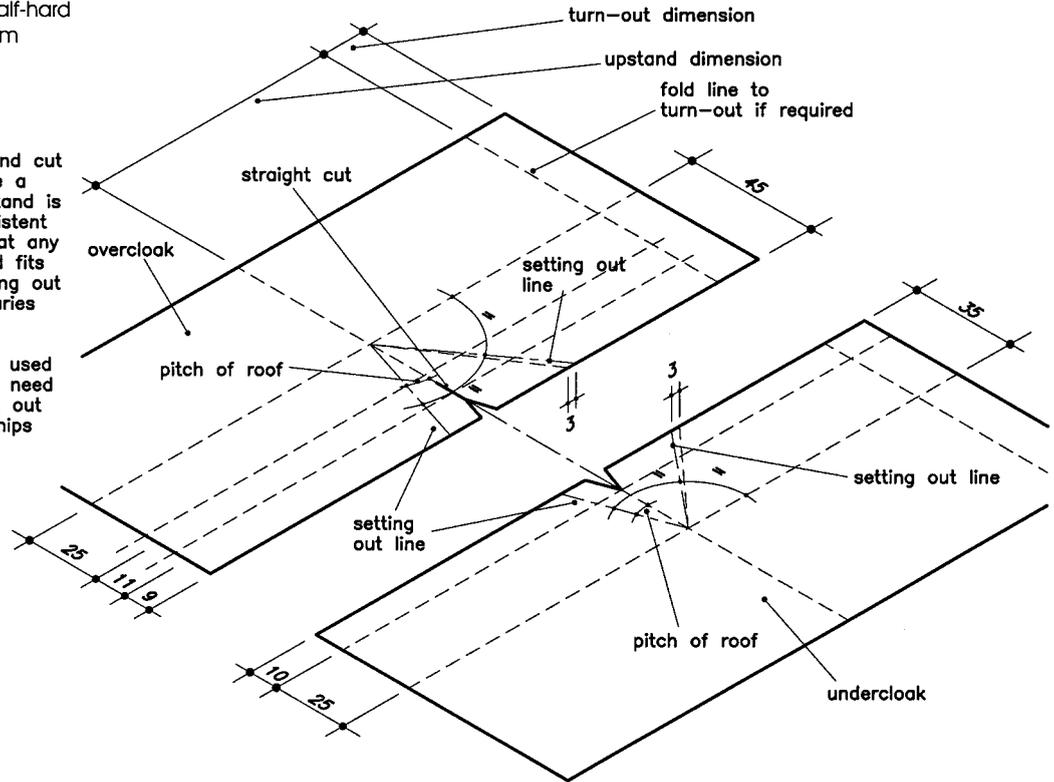
Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm

Stage 1

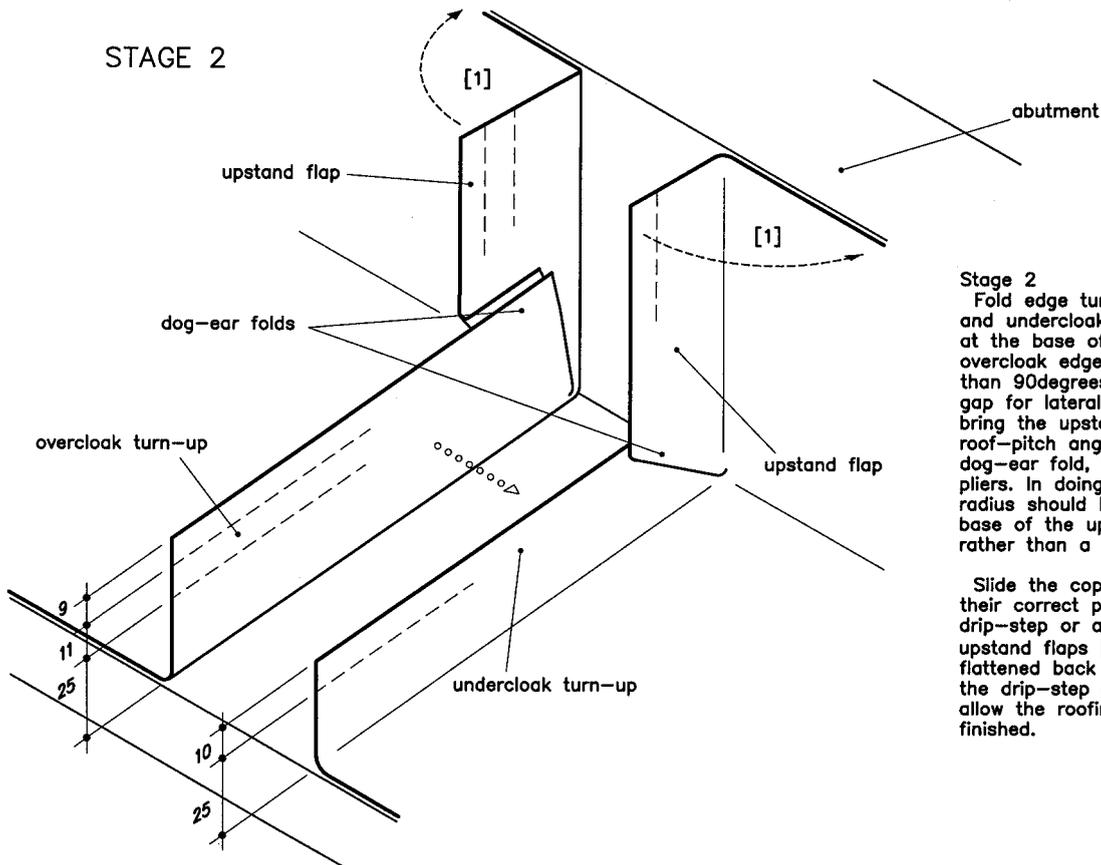
Mark out copper sheets and cut as shown. It is best to use a template so that each upstand is identical. This gives a consistent appearance and ensures that any cover flashing or downstand fits neatly. Note that the marking out gives the roof pitch and varies accordingly.

If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use straight snips for cutting.

STAGE 1



STAGE 2



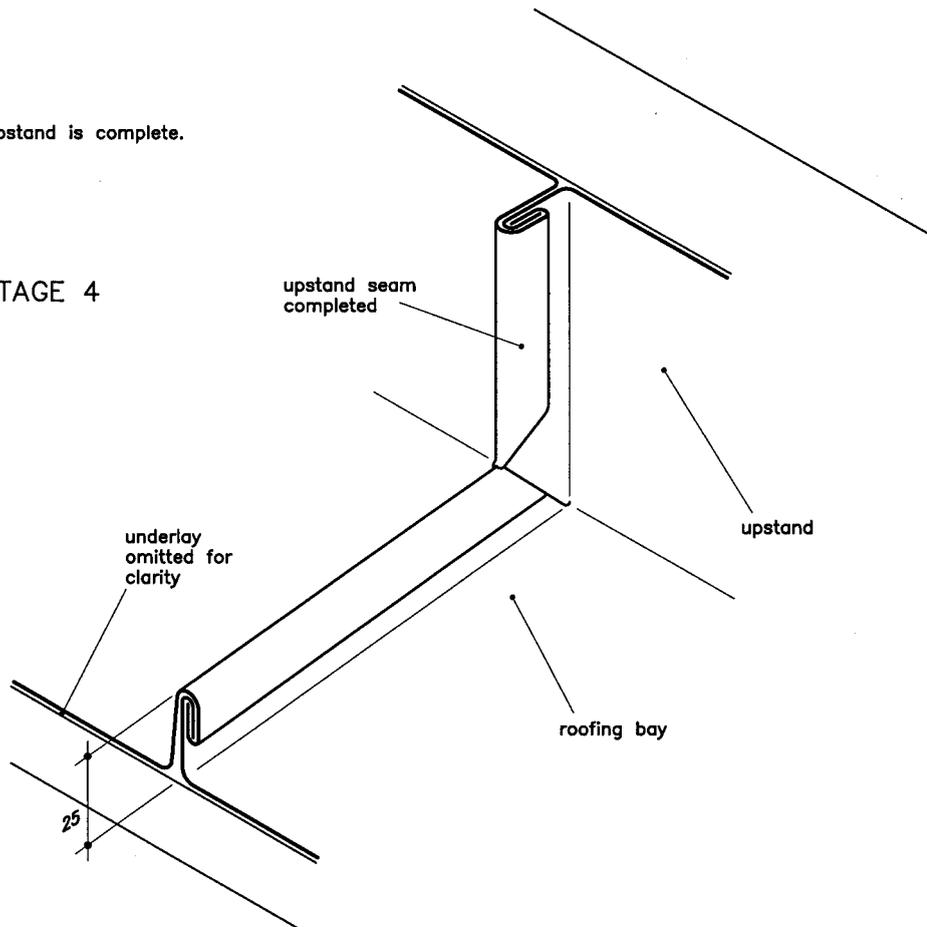
Stage 2

Fold edge turn-ups of overcloak and undercloak upright. The angle at the base of the 45mm overcloak edge turn-up is greater than 90degrees to allow a 3mm gap for lateral movement. Then bring the upstand up to the roof-pitch angle by forming a dog-ear fold, with dog-earring pliers. In doing this a slight radius should be made at the base of the upstand copper, rather than a sharp angle.

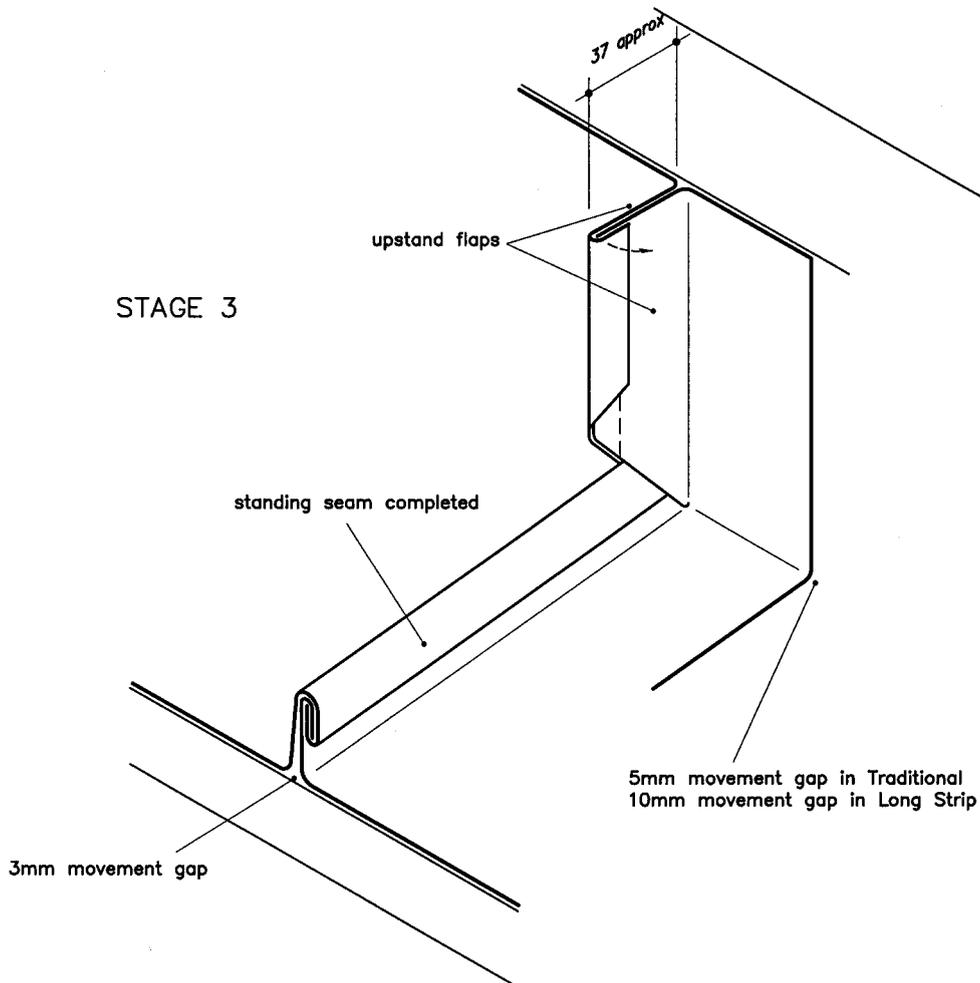
Slide the copper sheets up into their correct position against the drip-step or abutment. The upstand flaps [1] are then flattened back temporarily against the drip-step or abutment to allow the roofing seam to be finished.

Stage 4
The seam upstand is complete.

STAGE 4



STAGE 3



Stage 3
Close up roofing seam using seaming pliers or a seaming iron and a mallet. Then fold the upstand flaps forward to their correct position and close up the upstand seam.

Fig 9 Standard straight dog-eared upstand

Sometimes known as the 'Manchester fold', this is the preferred detail for drip-steps, batten ridges and batten hips. Because access behind the upstand is needed to complete the joint, a 'drop-in' section of substrate, say 120mm wide, is required at drip-steps. Similarly, the battens for ridges and hips are post-fixed.

The upstand height is limited to 60mm maximum. This is to limit the exposure of the vertical joint which, simply being a fold, is not entirely weathertight.

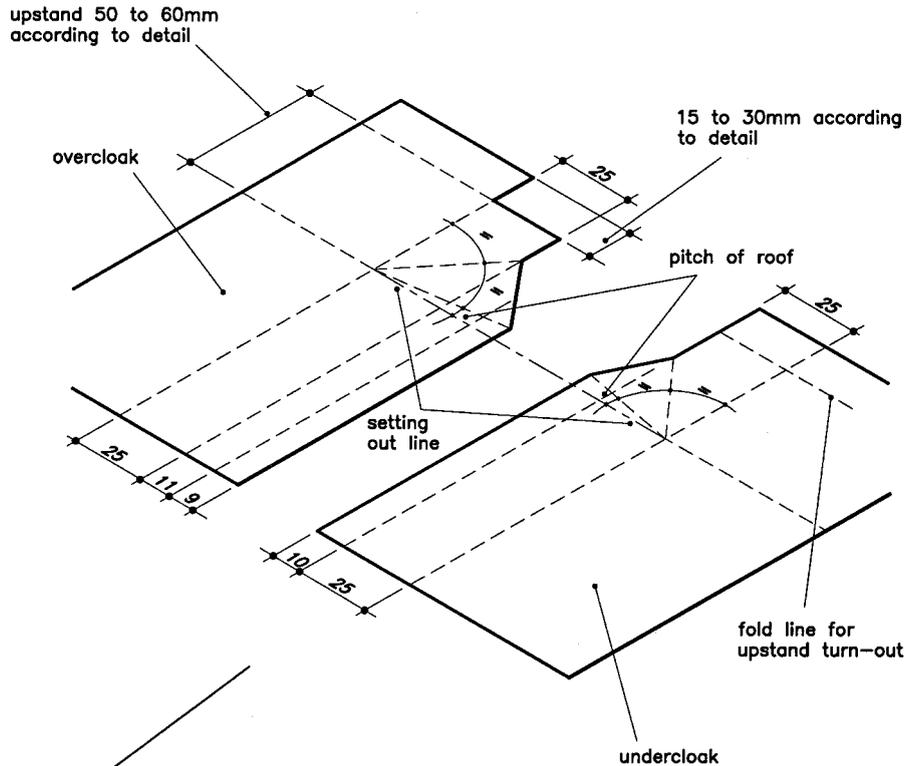
Temper: soft, quarter- or half-hard
 Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

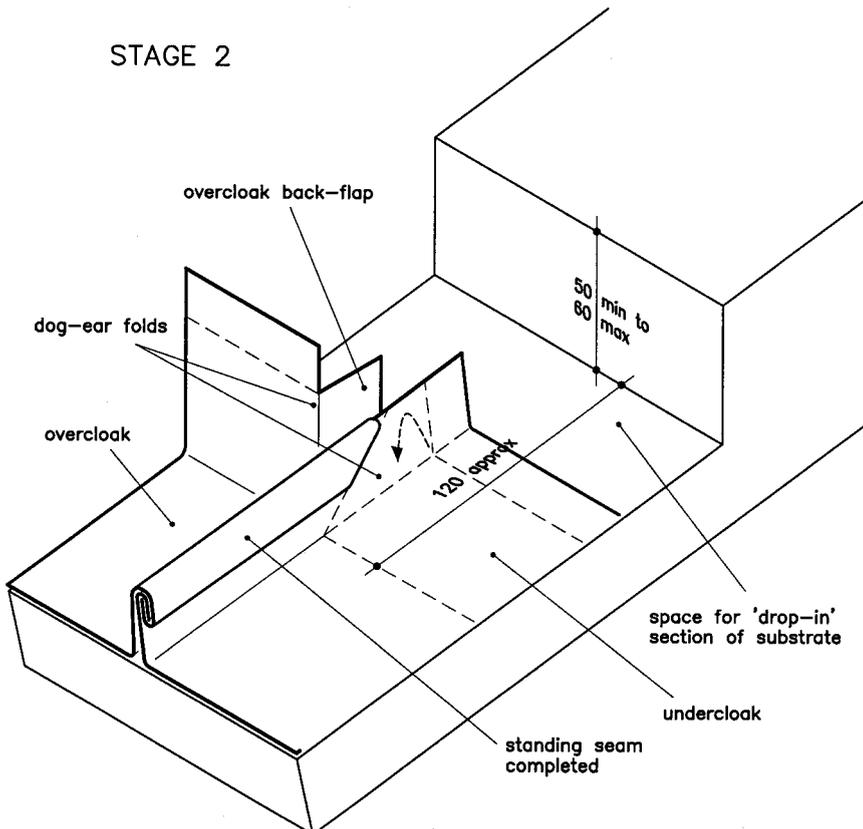
Stage 1
 Mark out copper sheets and cut as shown. It is best to use a template so that each upstand is identical. This gives a consistent appearance and ensures that any cover flashing fits neatly. Note that the marking out gives the roof pitch and varies accordingly.

If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use straight snips for cutting.

STAGE 1



STAGE 2



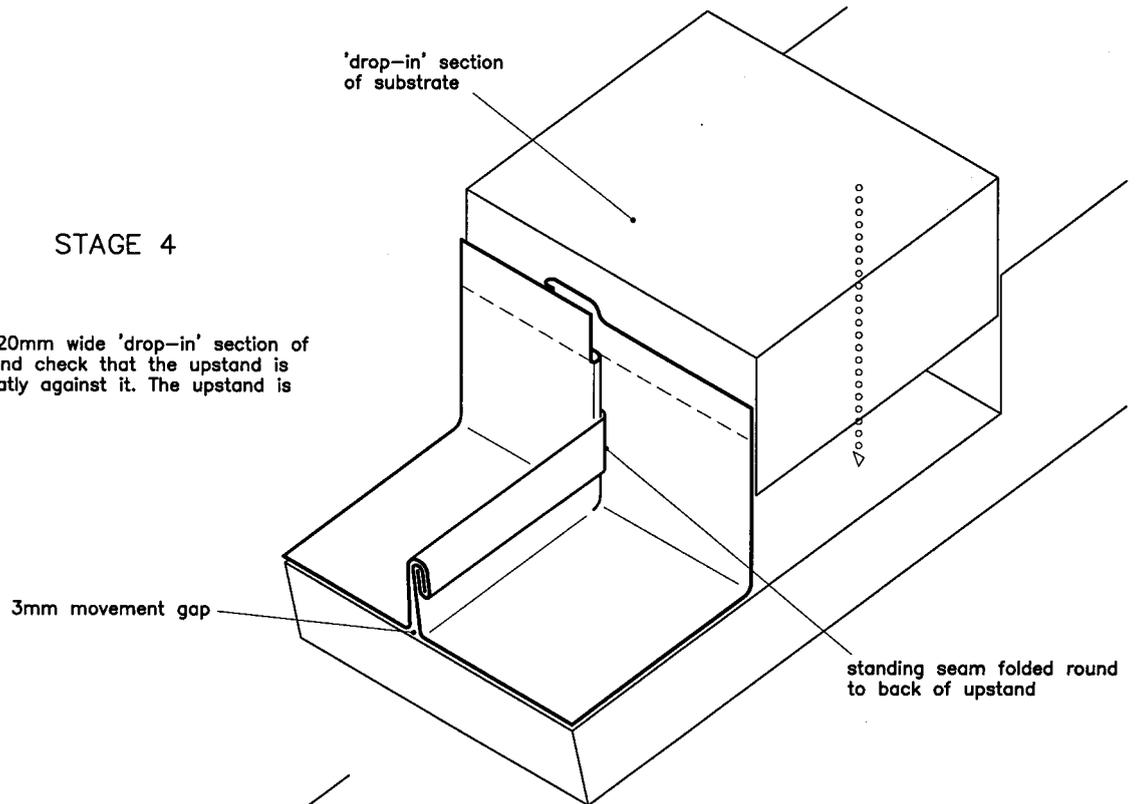
Stage 2
 Because access behind the upstand is needed to complete the joint, a 'drop-in' section of substrate, say 120mm wide, is required. For this reason the copper sheets can be placed in their correct position before working.

Fold edge turn-ups of overcloak and undercloak upright. The angle at the base of the 45mm overcloak edge turn-up is greater than 90degrees to allow a 3mm gap for lateral movement. Close up roofing seam using seaming pliers or a seaming iron and a mallet.

Then bring the overcloak upstand up to the roof-pitch angle with straight flat-nosed pliers, thus forming a dog-ear fold. In doing this a slight radius should be made at the base of the upstand copper, rather than a sharp angle. The folding creates a back-flap standing in line with the seam.

STAGE 4

Stage 4
Fix the 120mm wide 'drop-in' section of substrate and check that the upstand is dressed neatly against it. The upstand is complete.

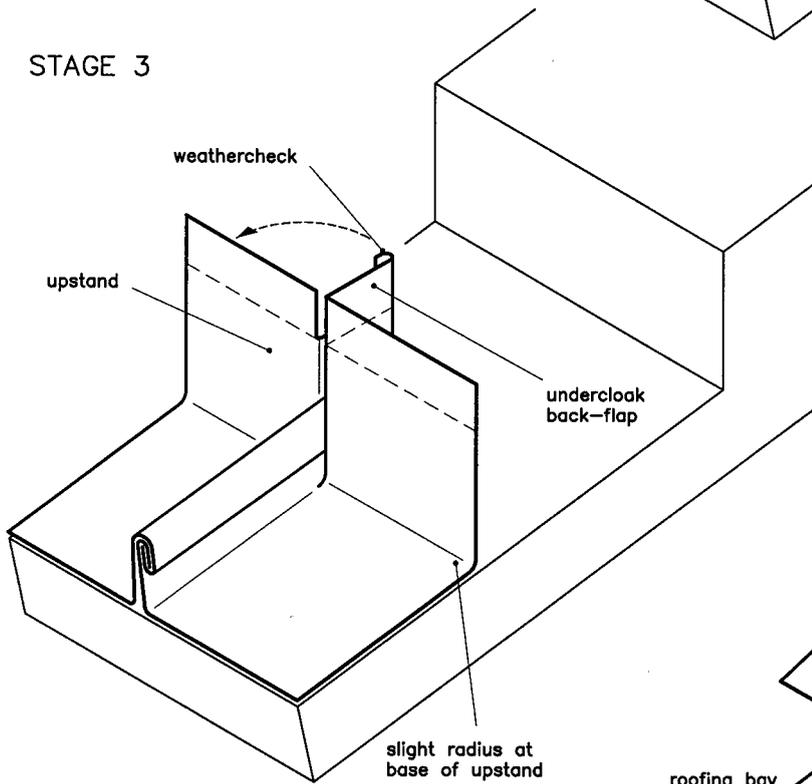


STAGE 3

Stage 3
Now bring the undercloak upstand up to match the other, also with a dog-ear fold.

For additional weathertightness, a small weathercheck can be provided by cobbling round the back edge of the undercloak back-flap.

Both back-flaps are turned together against the back of the copper upstand, using small cranked seaming pliers. They are then dressed tight against the upstand with a mallet or hammer.



STAGE 5

Stage 5
Form the turn-out to receive clips, lining plate, roofing copper to upper bay, capping etc, according to detail (see Figs 4e, 16, 16a, 19, 21, 23 and 23a).

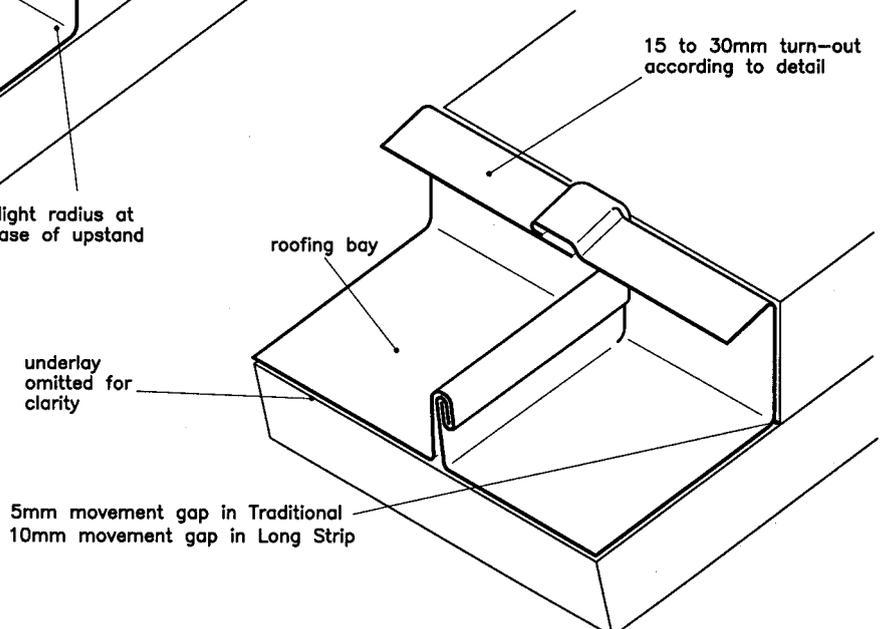


Fig 10 Pre-formed straight dog-eared upstand

This is a variant of the standard Straight dog-eared upstand (see Fig 9). It is an easy detail to form and allows most of the folding to be done in the workshop. It is a useful detail for drip-steps, batten ridges and batten hips.

The seam does not carry round the back of the upstand as in the standard version. This makes the detail less weathertight and for this reason is not recommended for roof pitches below 25degrees.

Unlike the standard version, access is not needed behind the upstand to complete the joint, so no 'drop-in' section of substrate or batten is required.

The upstand height is limited to 60mm maximum. This is to limit the exposure of the vertical joint.

As the trays will usually have been preformed in the workshop, the profiling machine automatically provides the 3mm gap needed to allow for lateral movement in the copper sheet.

TRADITIONAL ✓ LONG STRIP ✓

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm

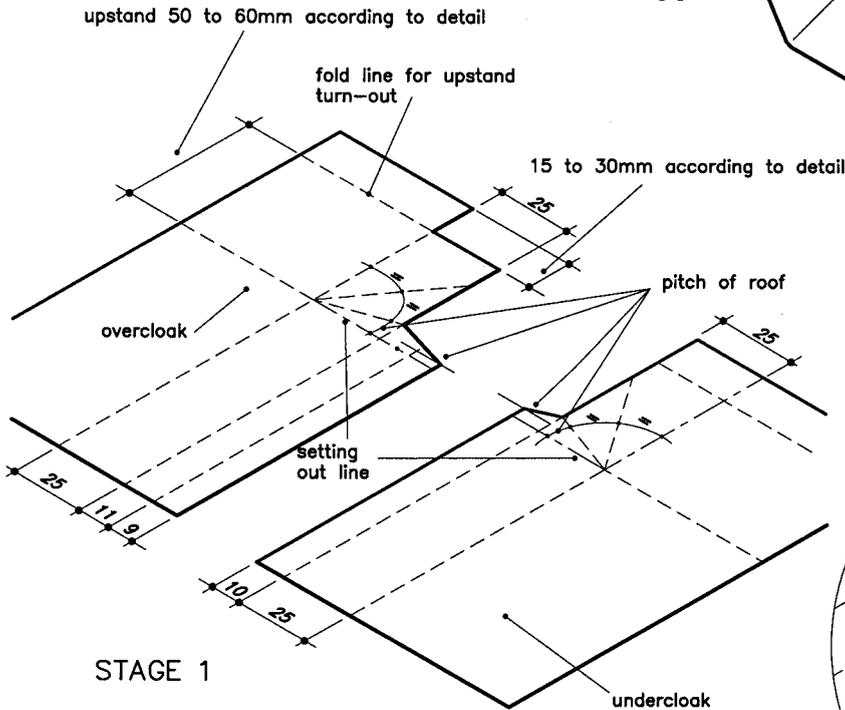
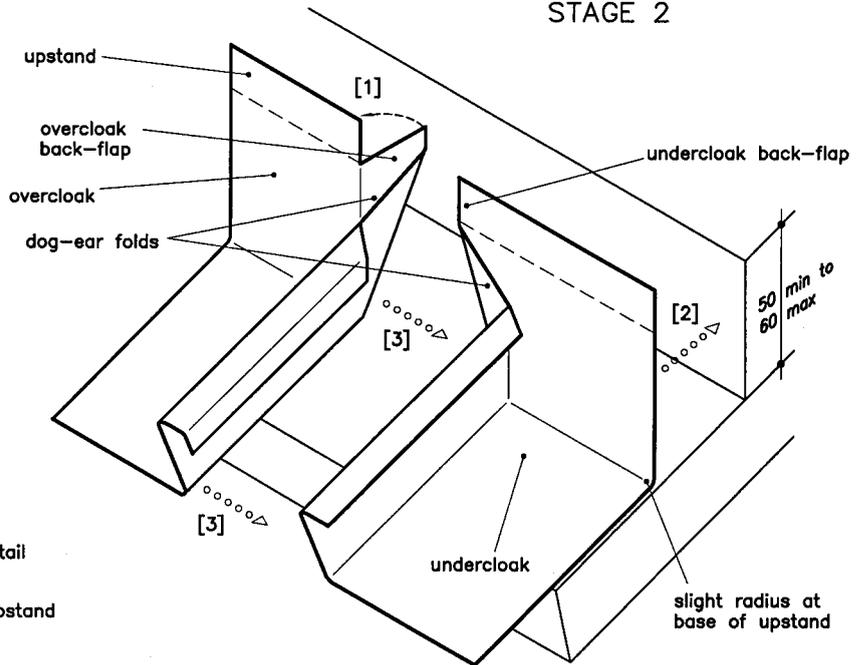
Stage 2

With the roofing sheets in position, bring the overcloak upstand up to the roof-pitch angle with straight flat-nosed pliers, thus forming a dog-ear fold. In doing this a slight radius should be made at the base of the upstand copper, rather than a sharp angle. The folding creates a back-flap standing in line with the seam. Then fold the back-flap round behind the upstand using pliers and dress tight against an 'H' seaming iron with a mallet [1].

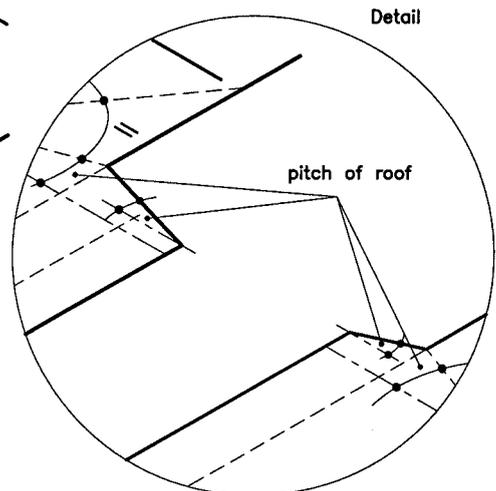
Now bring the undercloak upstand up to match the other, also with a dog-ear fold. The back-flap for the undercloak automatically forms in line with the upstand.

Slide the undercloak into its correct position against the step [2]. Engage the overcloak with the undercloak [3] and close up roofing seam using seaming pliers or a seaming iron and a mallet.

STAGE 2



STAGE 1

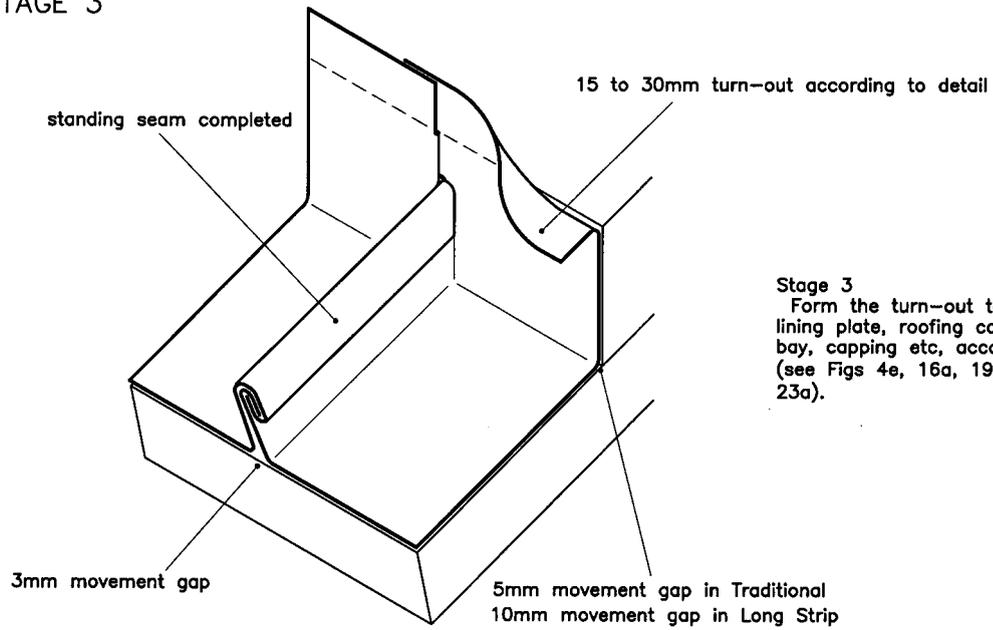


Stage 1

In the workshop mark out copper sheets and cut as shown. It is best to use a template so that each upstand is identical. This gives a consistent appearance and ensures that any cover flashing fits neatly. Note that the marking out gives the roof pitch and varies accordingly.

Use straight snips for cutting.

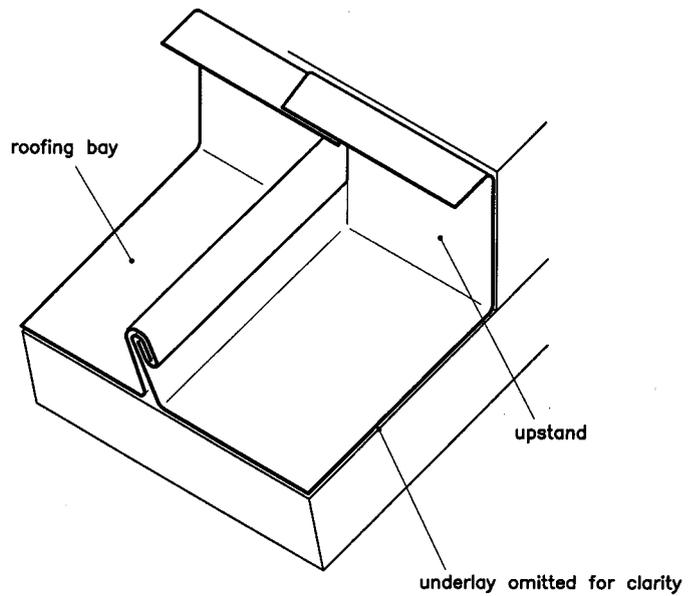
STAGE 3



Stage 3
Form the turn-out to receive clips, lining plate, roofing copper to upper bay, capping etc, according to detail (see Figs 4e, 16a, 19, 21, 23 and 23a).

STAGE 4

Stage 4
The seam upstand is complete.



This upstand is only possible in Traditional roofing. The copper sheets are worked and joined on the surface of the substrate and pushed up against the drip or upstand fully formed. The maximum sheet length of 1800mm now permissible makes this a practical proposition.

Temper: soft or quarter-hard, preferably. If half-hard is used the sides of the copper sheet must be cut tapered to the start of the splay as shown.
Thickness: 0.6mm or 0.7mm

The minimum upstand dimension that can be formed, excluding any turn-out, is 50mm.

The cutting away shown at Stage 1 is not essential, but it does make the folding of the upstand easier, especially when using half-hard copper.

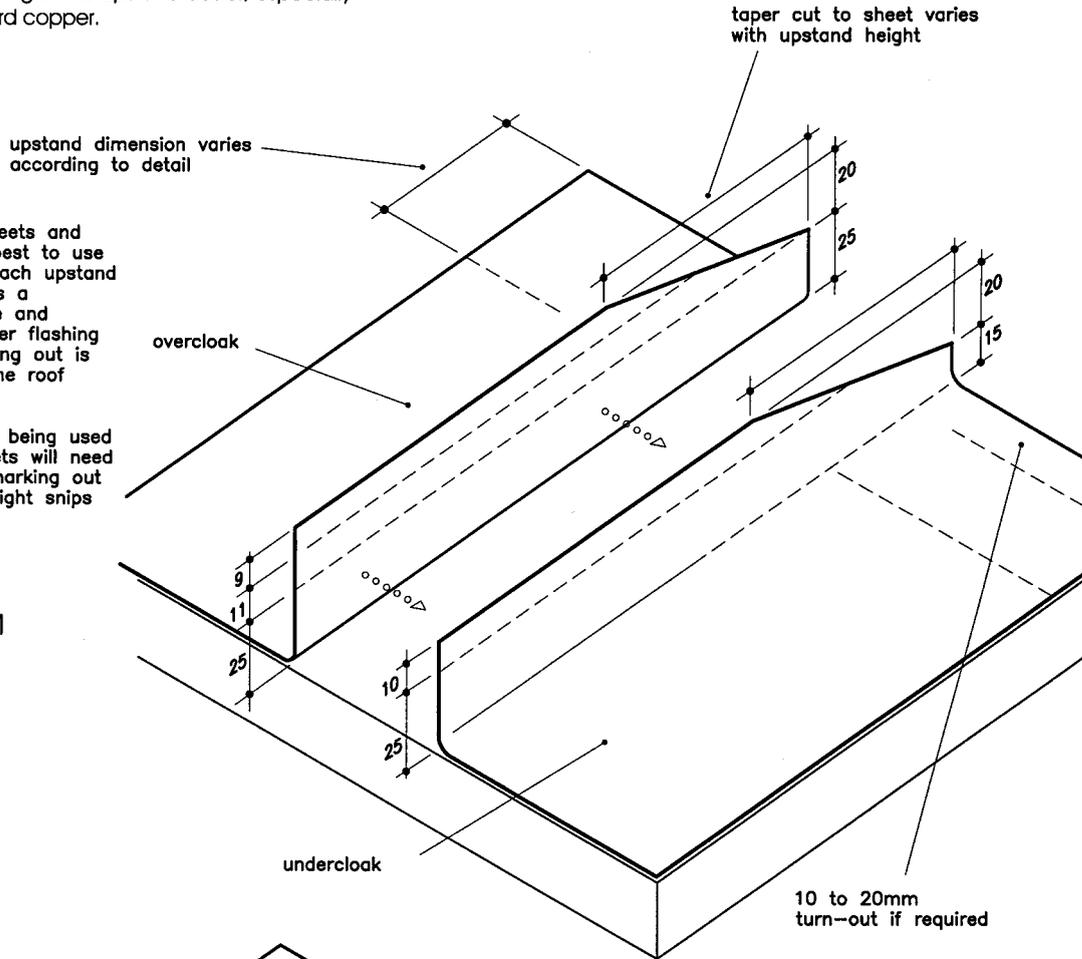
TRADITIONAL ✓ LONG STRIP X

Stage 1

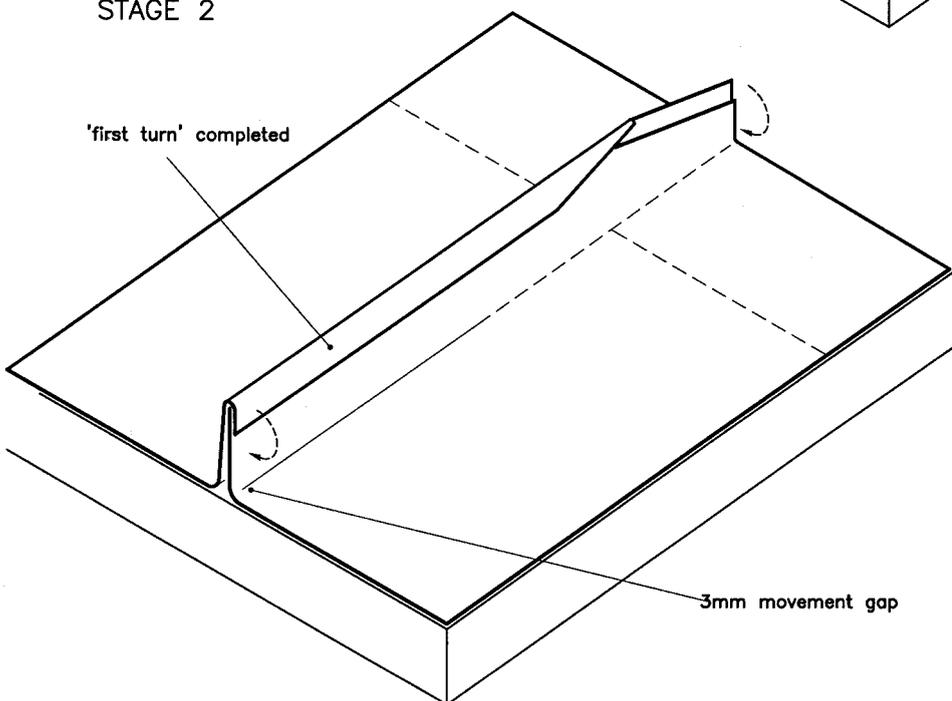
Mark out copper sheets and cut as shown. It is best to use a template so that each upstand is identical. This gives a consistent appearance and ensures that any cover flashing fits neatly. The marking out is the same whatever the roof pitch.

If profiled trays are being used the ends of the sheets will need to be flattened for marking out and cutting. Use straight snips for cutting.

STAGE 1



STAGE 2



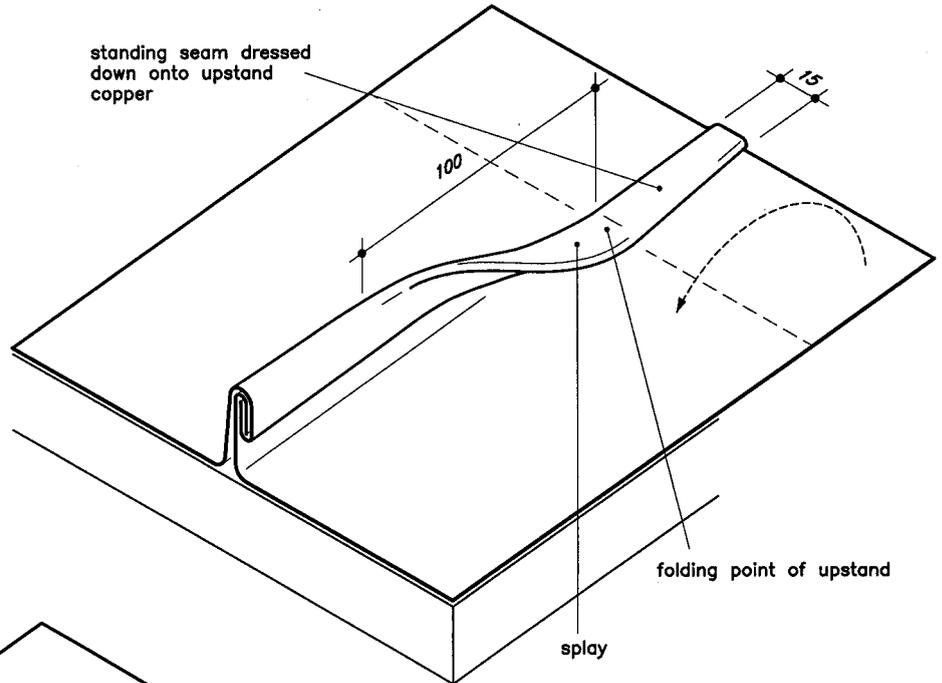
Stage 2

Dress overcloak over and down using a seaming iron, placed with 'first turn' iron against undercloak, and a wooden seaming mallet.

Stage 4

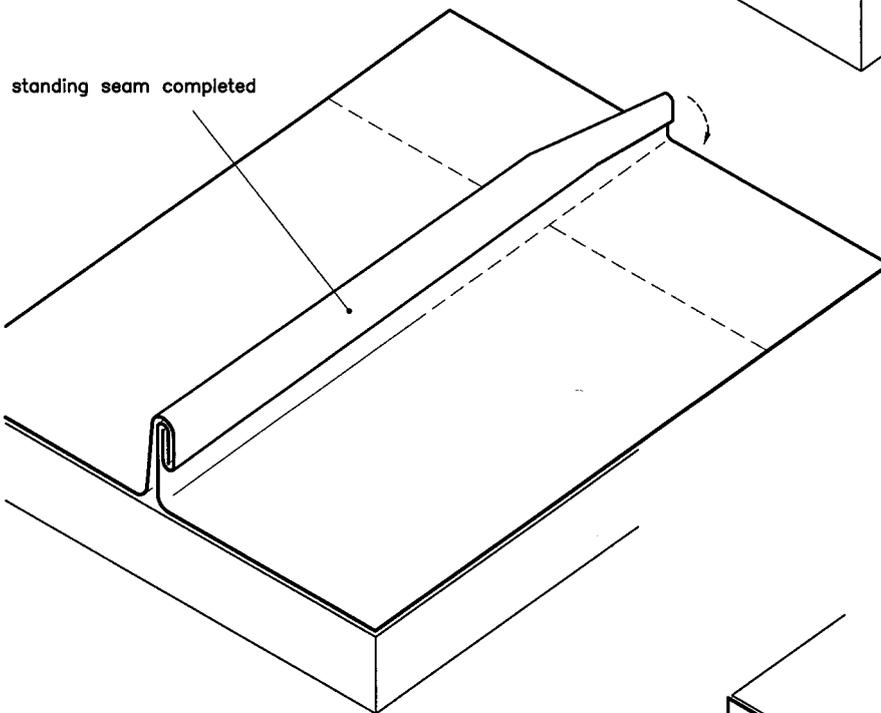
Dress standing seam over onto copper upstand using a wooden seaming mallet. Make sure that all seams are turned down from the same point to achieve a neat appearance. This will be 100mm minimum from the upstand fold.

STAGE 4



STAGE 3

standing seam completed



Stage 3

Dress overcloak and undercloak over and down to complete the joint.

STAGE 5

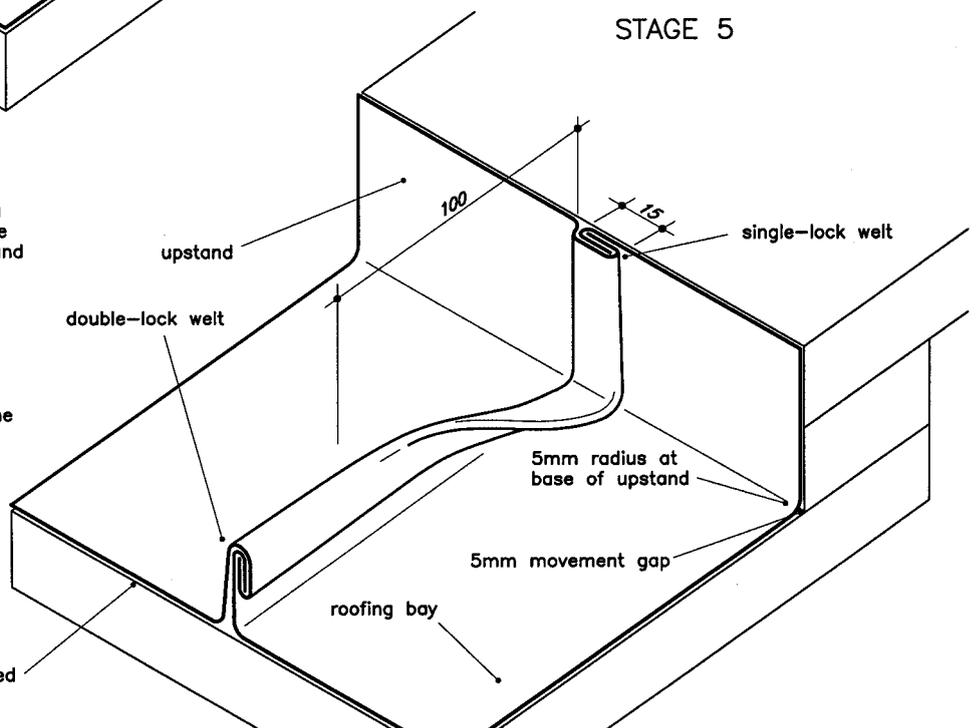
Stage 5

Fold the upstand into the upright position. In doing this a radius 5mm minimum should be made at the base of the upstand copper, rather than a sharp angle. It will be necessary to indent the seam at the folding point with the blade head of a hammer to start the fold.

Slide the roofing sheets into their correct position against the step.

Form the turn-out to receive clips, lining plate, roofing copper to upper bay, capping etc, according to detail.

underlay omitted for clarity



* In Traditional roofing the Turned-down seam upstand (see Fig 11) or a sweep-type standing seam upstand folded over (see Figs 7 and 18) is used.
 * In Long Strip roofing this sort of welted flashing detail is not possible. Instead use the Sweep standing seam (see Fig 7a) or the Pinched seam upstand (see Fig 12a).
 * Joints in cover flashings should be at 2m maximum centres. They are made with lapped joints: either 150mm as shown; or 50mm with a check and sealed (see Fig 12b).
 * The turn-up of the cover flashing is cut away at 45degrees at joints in the run. Similarly at the check edge in the brick course.

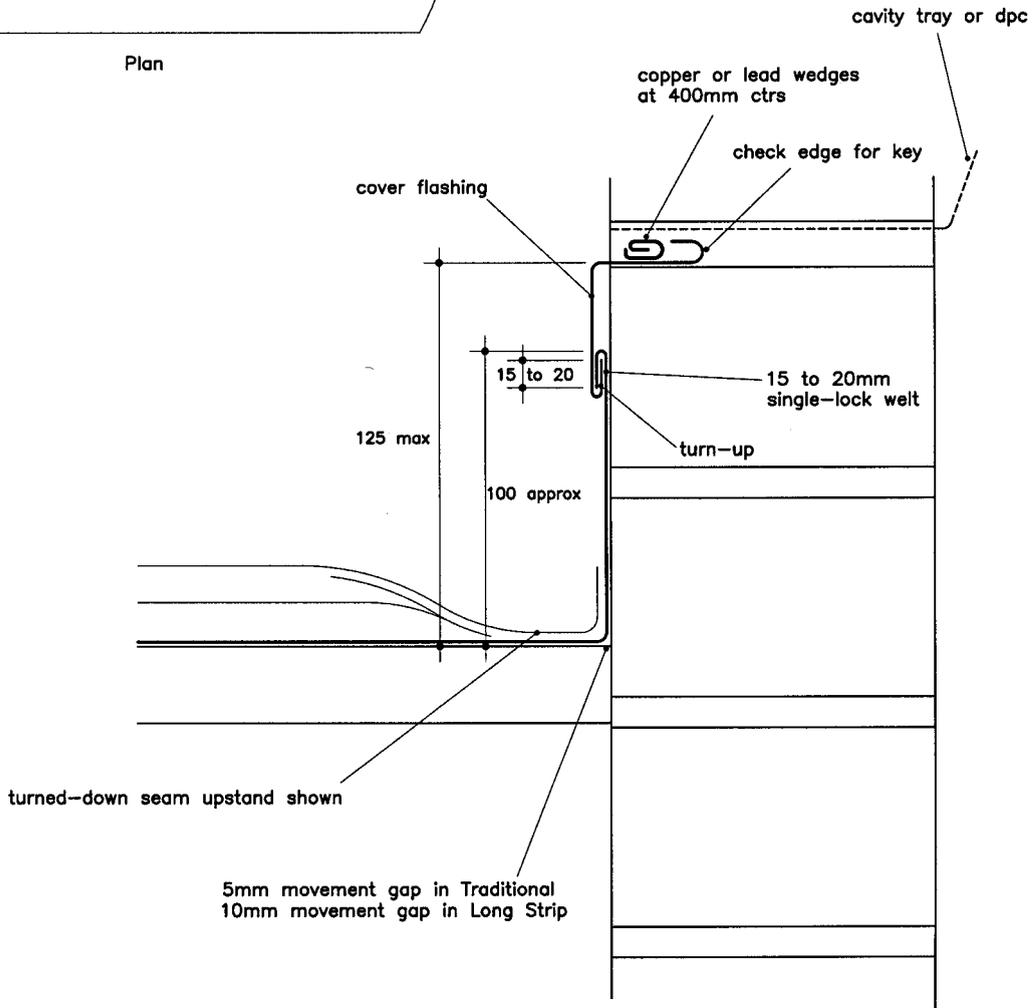
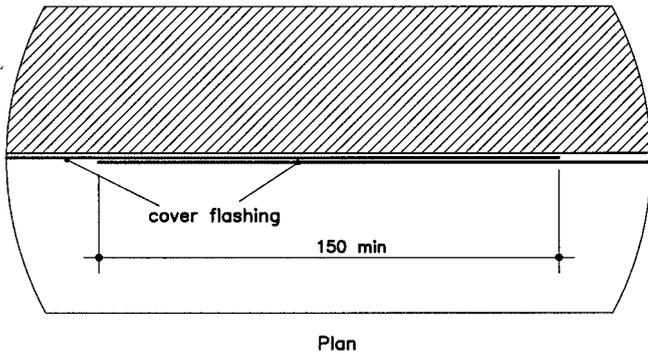
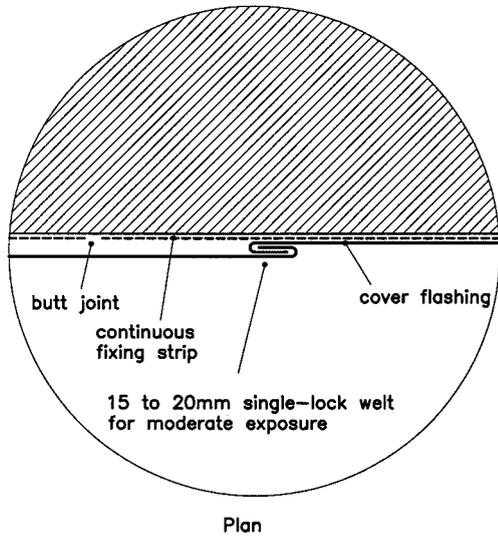


Fig 11a
 Vertical upstand 125mm max with horizontal
 cover flashing to brickwork
 TRADITIONAL ✓ LONG STRIP ✗



- * For Traditional roofing see Note to Fig 11a opposite.
- * For Long Strip roofing see Note to Fig 11a opposite.
- * The continuous fixing strip is fixed to the brickwork with 32mm No8 round head screws at 300mm centres, together with washers and plugged.
- * Joints in the continuous fixing strip are butt jointed.
- * Joints in cover flashings should be at 2m maximum centres. They can be made with lapped joints: either 150mm or 50mm with a check and sealed; or with single- or double-lock welt, according to exposure (see Figs 11a, 11c and 12b). Double-lock welts will be difficult to form in this situation and should be pre-formed.
- * The turn-up of the cover flashing is cut away at 45degrees at joints in the run. Similarly at the check edge in the brick course.

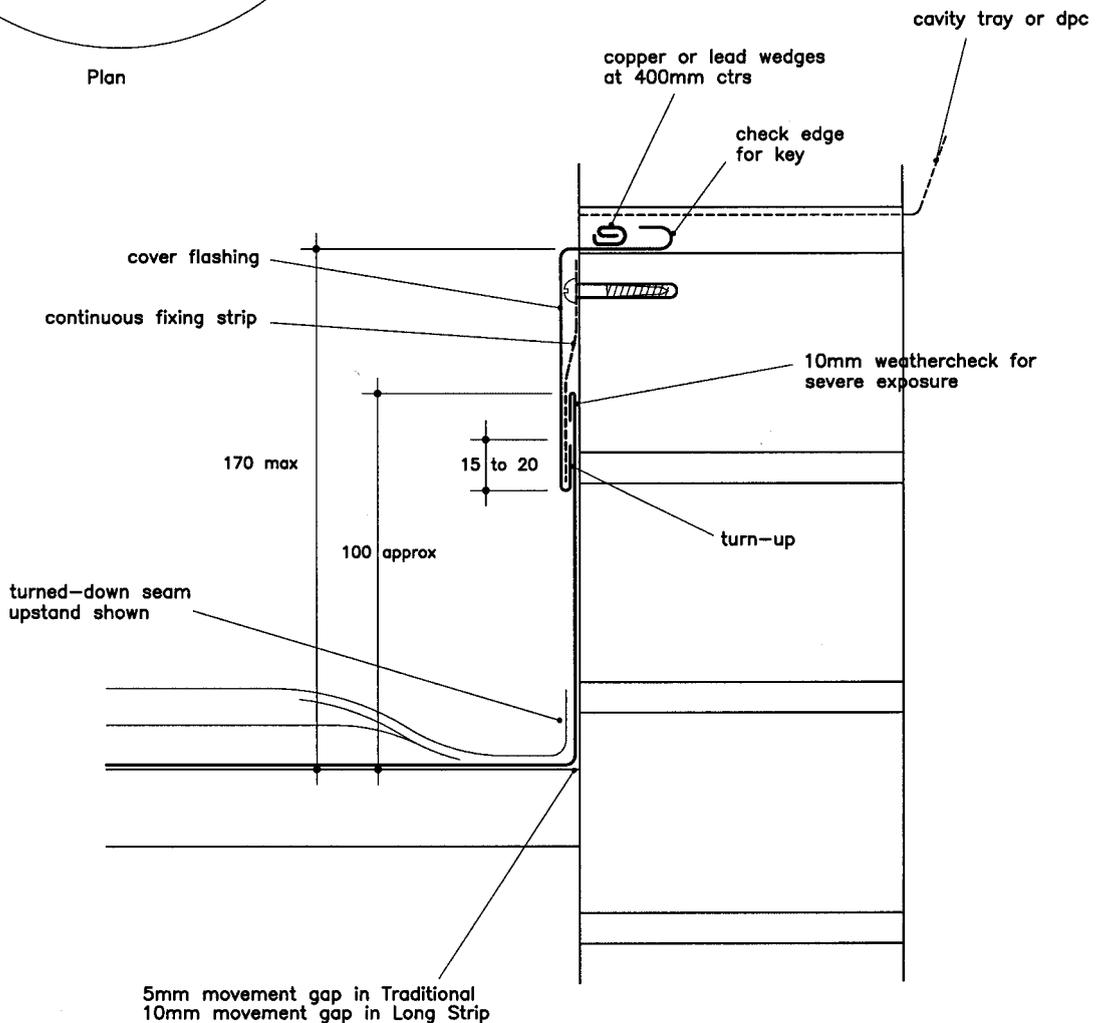


Fig 11b
Vertical upstand 170mm max with horizontal cover flashing to brickwork

TRADITIONAL LONG STRIP

- * For Traditional roofing see Note to Fig 11a (p44).
- * For Long Strip roofing see Note to Fig 11a (p44).
- * The continuous fixing strip is fixed to the brickwork with 32mm No8 round head screws at 300mm centres, together with washers and plugged.
- * Joints in the continuous fixing strip are butt jointed.
- * Joints in cover flashings should be at 2m maximum centres. They can be made with single- or double-lock welts, according to exposure (see Fig 11b). Double-lock welts will be difficult to form in this situation and should be pre-formed.
- * The turn-up of the cover flashing is cut away at 45degrees at joints in the run. Similarly at the check edge in the brick course.

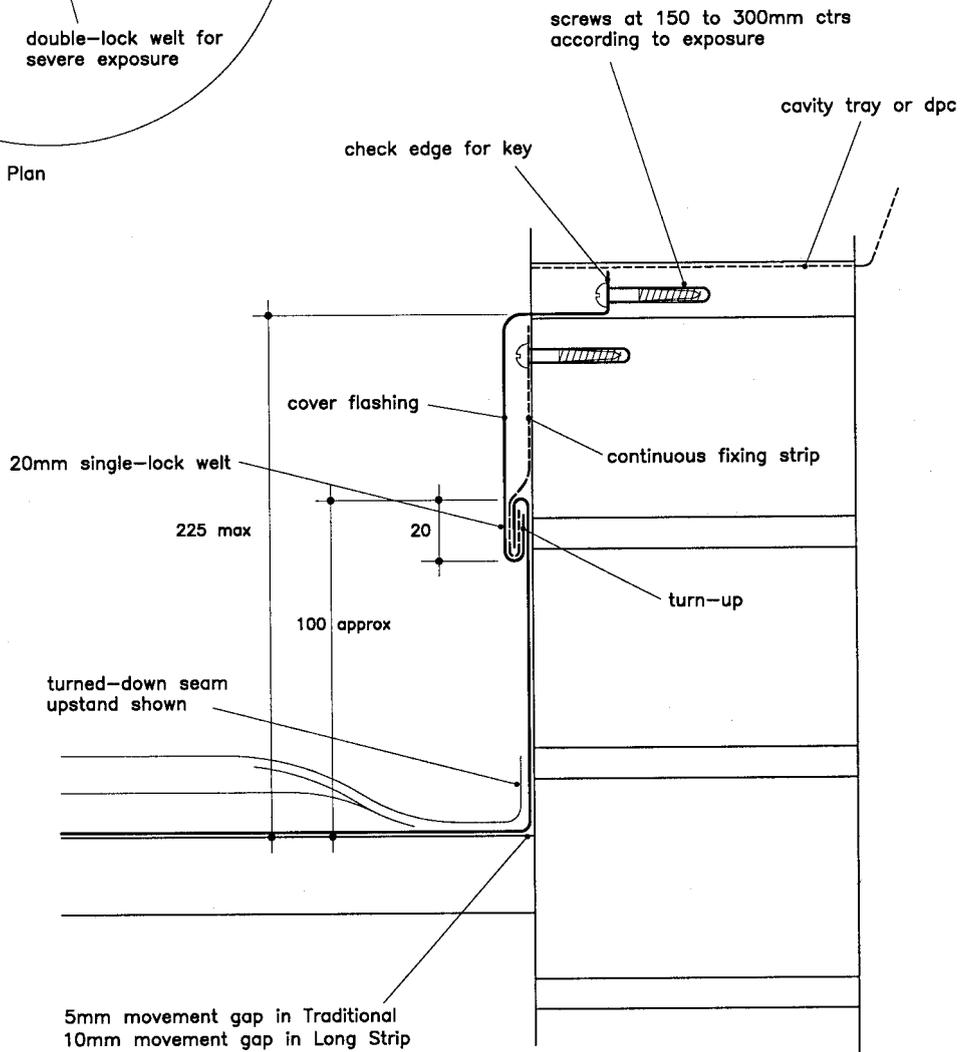
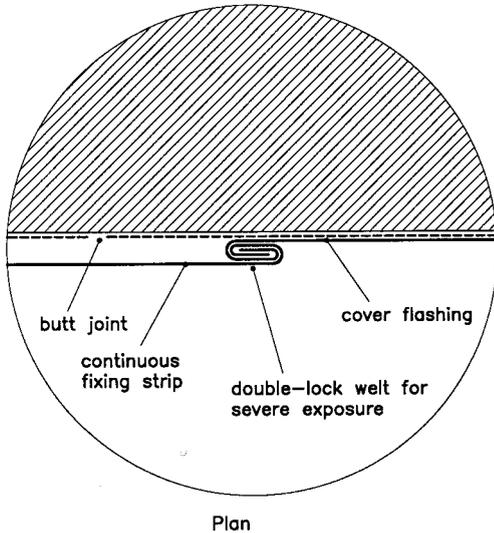


Fig11c
Vertical upstand 225mm max with horizontal
cover flashing to brickwork

TRADITIONAL LONG STRIP

Fig 12 Pinched seam upstand against horizontal abutment

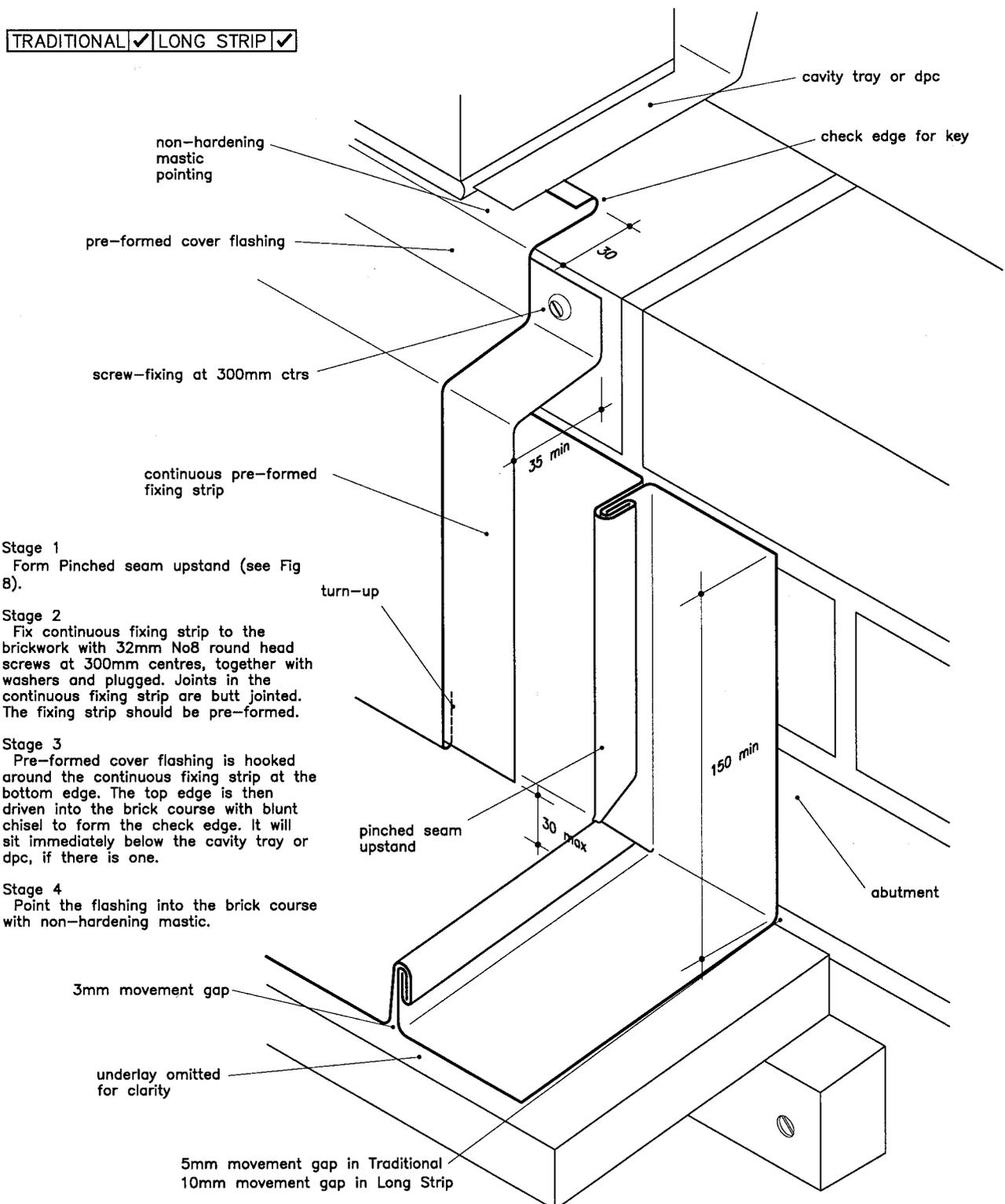
The minimum upstand height is usually 150mm. Where this is difficult to achieve, the height can be reduced to 100mm if the top of the upstand is turned out 15mm, as shown on Fig 12a (p48).

Joints in cover flashings should be at 2m maximum centres. They can be made with lapped joints: either 150mm or 50mm with a check and sealed; or with single- or double-lock welts, according to exposure (see Figs 12b, 11a, 11b and 11c). The return folds of the welts are formed before the cover flashing is bent to shape. Double-Lock welts will be difficult to form in this situation.

With lapped joints, the check edge in the brick course is cut away from the undercloak for the length of the lap. With welded joints, the undercloak corner is cut away at 45degrees to reduce the bulk of the copper; similarly the corner of the turn-up to the cover flashing.

As drawn the detail is only suitable for warm roofs, ie un-ventilated.

Temper: Pinched seam upstand; soft, quarter- or half-hard.
Pre-formed cover flashing etc; half-hard.
Thickness: 0.6mm or 0.7mm



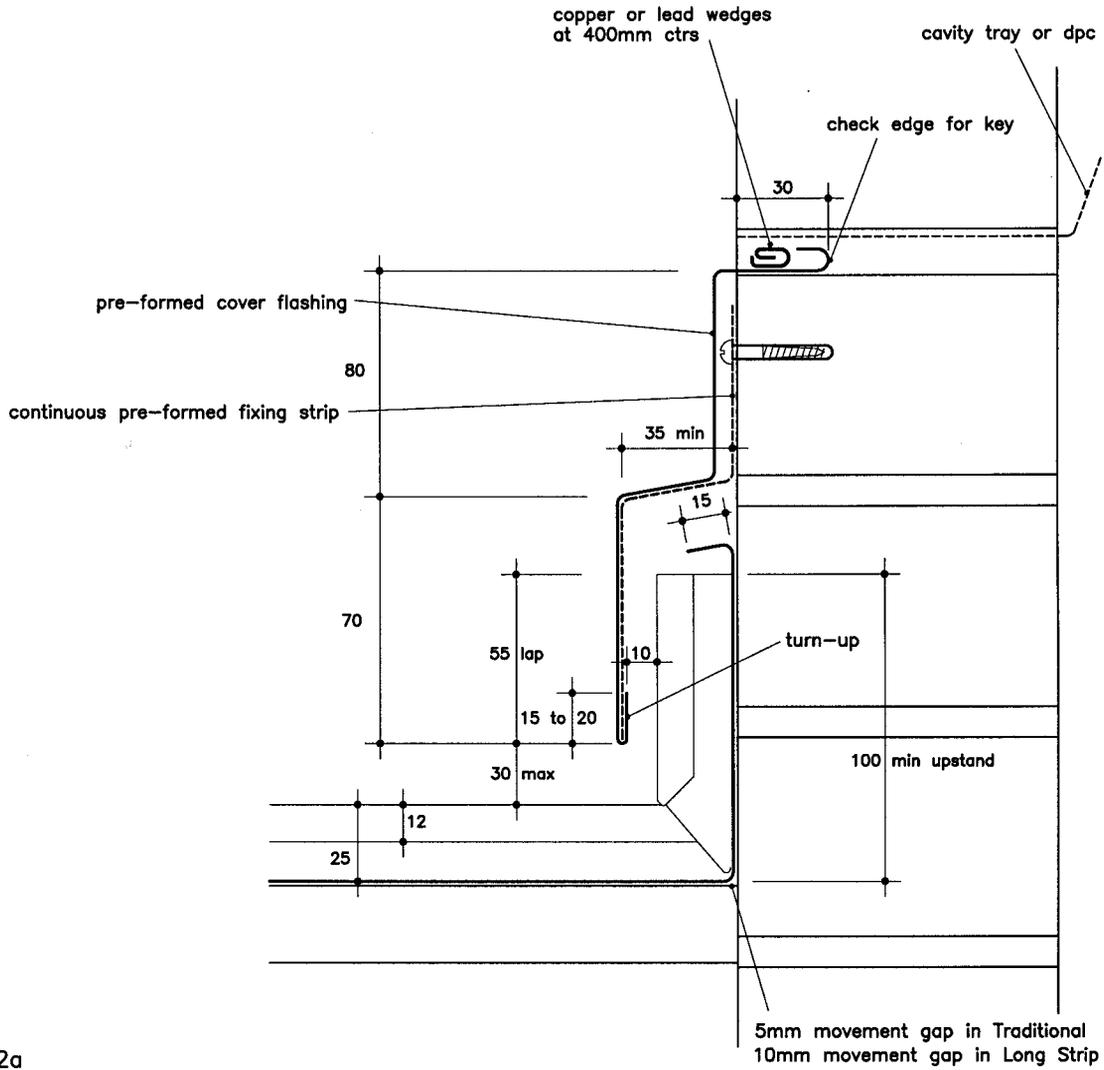


Fig 12a
Pinched seam with minimum upstand

TRADITIONAL ✓ LONG STRIP ✓

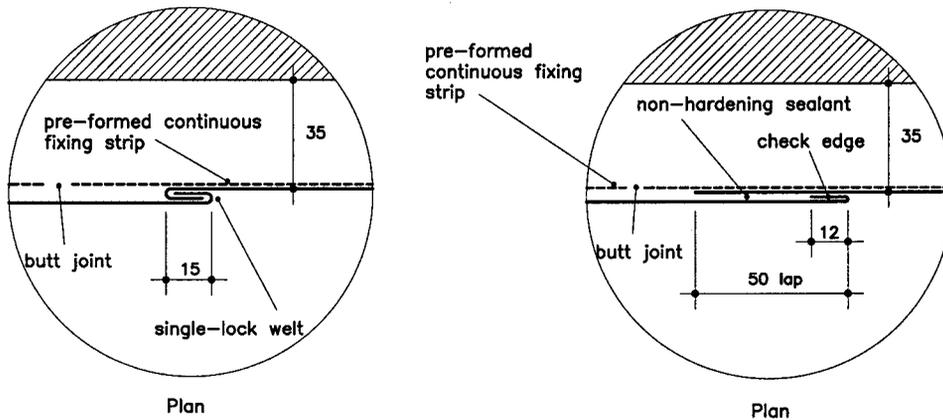


Fig 12b
Joints in cover flashings

TRADITIONAL ✓ LONG STRIP ✓

* See also Figs 11a, 11b and 11c.

Fig 13 Pinched seam ventilated upstand against horizontal abutment

Stage 1
Screw the support brackets to the underside of the weathered timber section. The brackets should be housed in to provide a flush surface for the insect mesh to fit against. Plug and screw the brackets to the wall.

Then plug and screw the substrate upstand to the wall via timber blocks.

Nail the pre-formed insect mesh at 100mm centres to the front edge of the timber section and the substrate upstand.

Stage 2
Form Pinched seam upstand (see Fig 8).

Stage 3
Nail the continuous fixing strip to the timber section. Joints in the continuous fixing strip are butt jointed. The fixing strip should be pre-formed.

Stage 4
Pre-formed cover flashing is hooked around the continuous fixing strip at the bottom edge. The top edge is then driven into the brick course with blunt chisel to form the check edge. It will sit immediately below the cavity tray or dpc, if there is one.

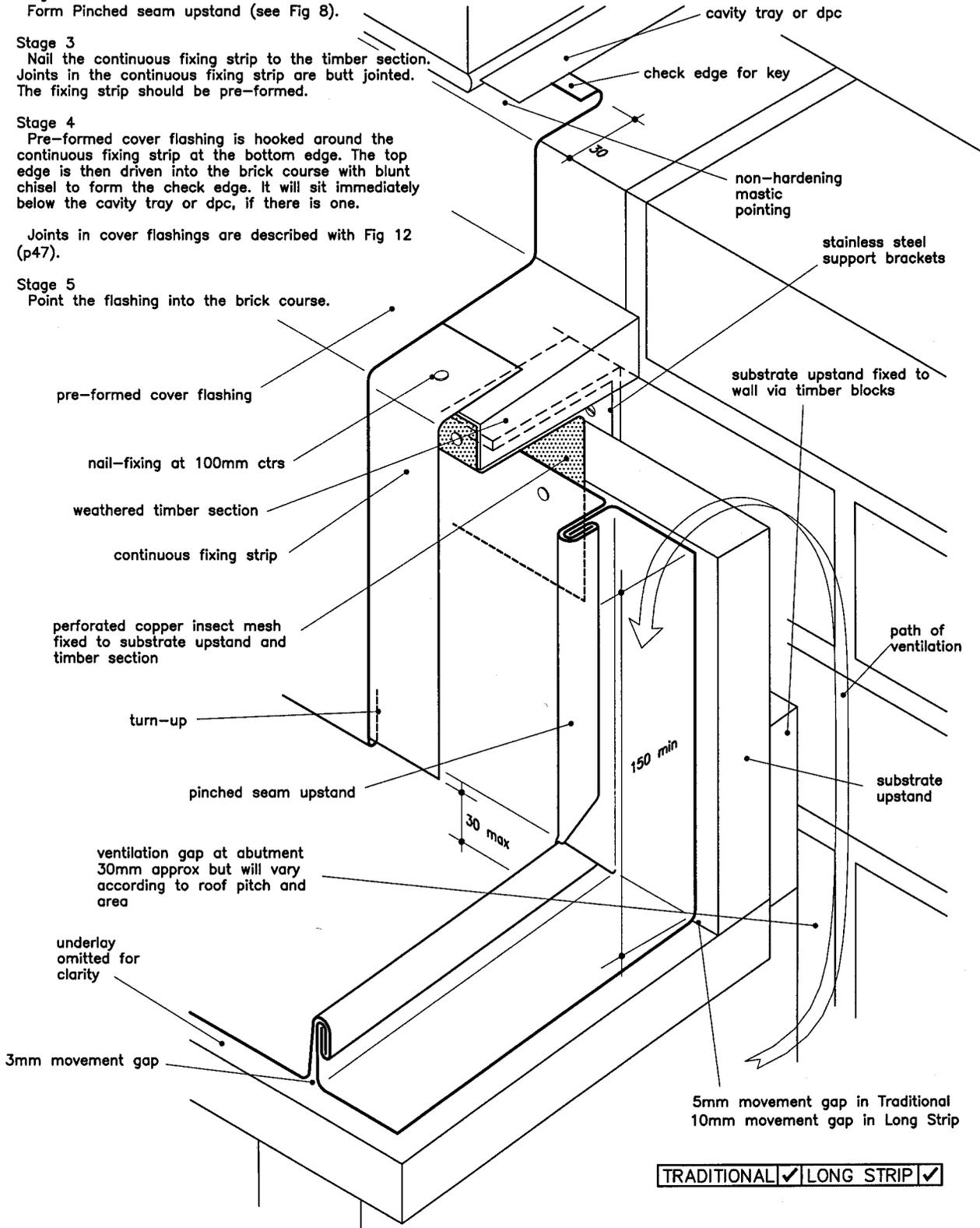
Joints in cover flashings are described with Fig 12 (p47).

Stage 5
Point the flashing into the brick course.

The minimum upstand height is usually 150mm. Where this is difficult to achieve, the height can be reduced to 100mm if the top of the upstand is turned out 15mm, as shown on Fig 12a (p48).

The detail is necessary for roofs which require ventilating to avoid the risk of condensation.

Temper: Pinched seam upstand; soft, quarter- or half-hard. Pre-formed cover flashing etc; half-hard. Thickness: 0.6mm or 0.7mm



TRADITIONAL ✓ LONG STRIP ✓

Fig 14 ... junction with hand-formed double-lock cross welt

This detail is mainly for use in Traditional roofing because it allows no longitudinal movement. However, with the cross welt not clipped, it is sometimes used in Long Strip roofing as described with Fig 15 and shown on Fig 15b (p52).

When pre-patinated copper sheets have been specified, it is better to use the pre-formed cross welt as some of the patina will be lost in the hand-forming (see Figs 15 and 15a). The pre-formed version also tends to give cleaner lines.

In both Traditional and Long Strip roofing, the double-lock cross welt can only be used with roof pitches at and over 20degrees. If sealed they can be used with roof pitches down to 6degrees.

In Traditional roofs the cross welts will occur at 1725mm centres maximum (see Table G, p9).

Temper: soft, quarter- or half-hard. With quarter- or half-hard the clip at the centre of the bay is not required; and in Long Strip roofing must not be provided.

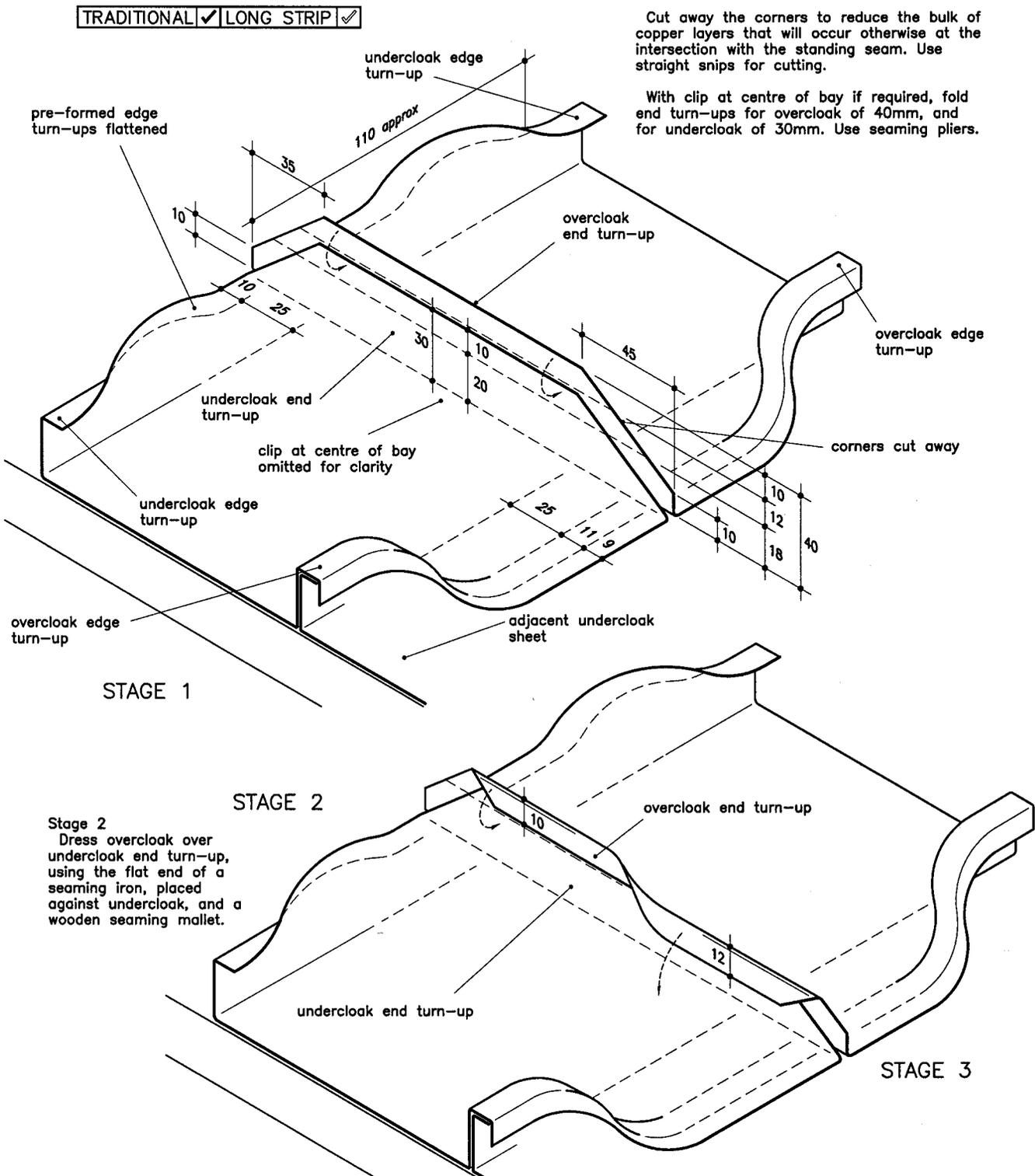
Thickness: 0.6mm or 0.7mm

Stage 1

Flatten pre-formed edge turn-ups of overcloak and undercloak at the ends of the sheets or trays to be joined, to allow marking out and cutting.

Cut away the corners to reduce the bulk of copper layers that will occur otherwise at the intersection with the standing seam. Use straight snips for cutting.

With clip at centre of bay if required, fold end turn-ups for overcloak of 40mm, and for undercloak of 30mm. Use seaming pliers.



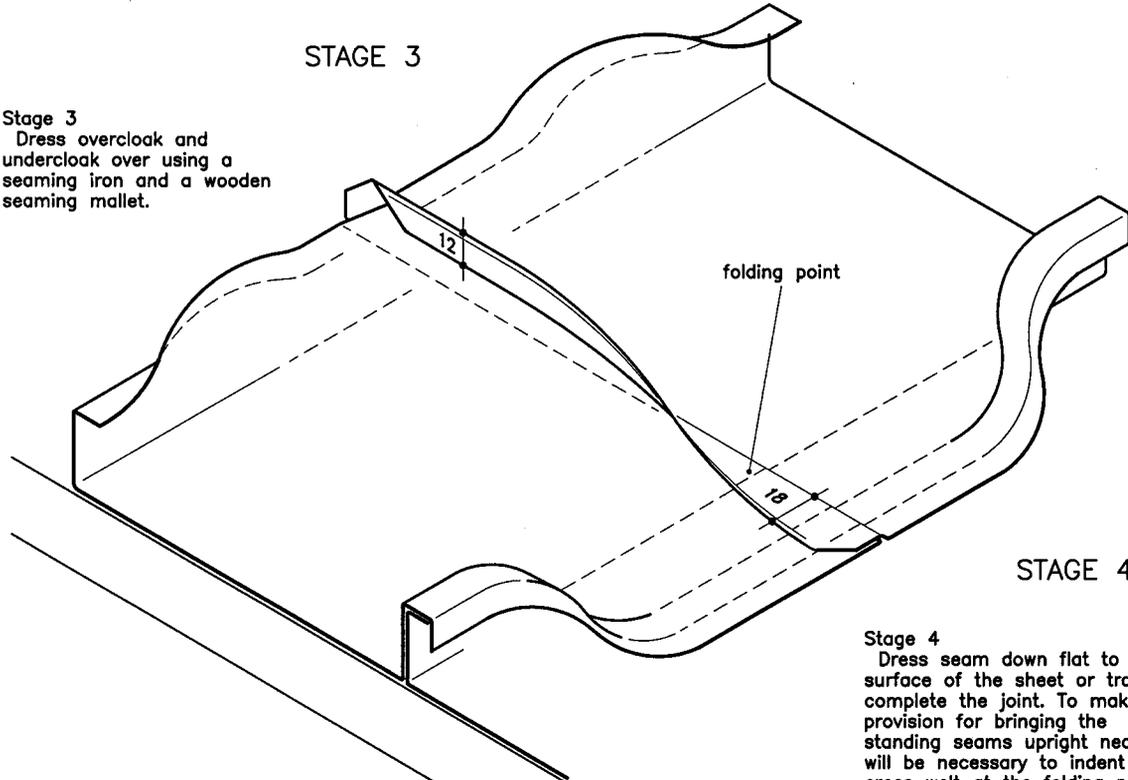
TRADITIONAL ✓ LONG STRIP ✓

STAGE 1

STAGE 2

Stage 2
Dress overcloak over undercloak end turn-up, using the flat end of a seaming iron, placed against undercloak, and a wooden seaming mallet.

STAGE 3



STAGE 4

Stage 4
Dress seam down flat to the surface of the sheet or tray to complete the joint. To make provision for bringing the standing seams upright neatly, it will be necessary to indent the cross welt at the folding point with the blade head of a hammer, to start the fold.

Stage 5
Reform the edge turn-ups flattened for Stage 1 and complete the double-lock standing seams (see Figs 1 and 2).

In reality the adjacent undercloak sheet or tray would be in position beneath the overcloak edge turn-up, but for clarity this has been omitted from the description. As drawn the copper roofing would be completed in sequence, working from right to left.

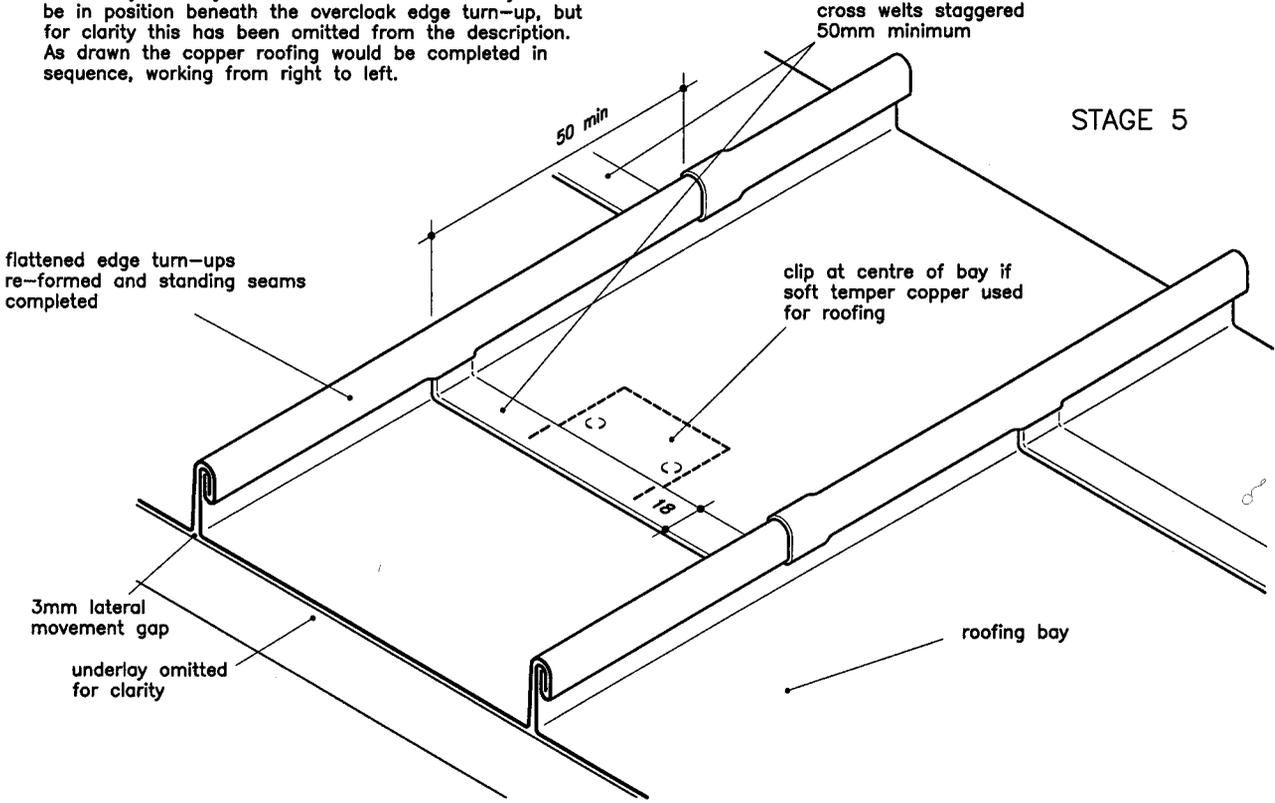


Fig 15 ... junction with pre-formed double-lock cross welt

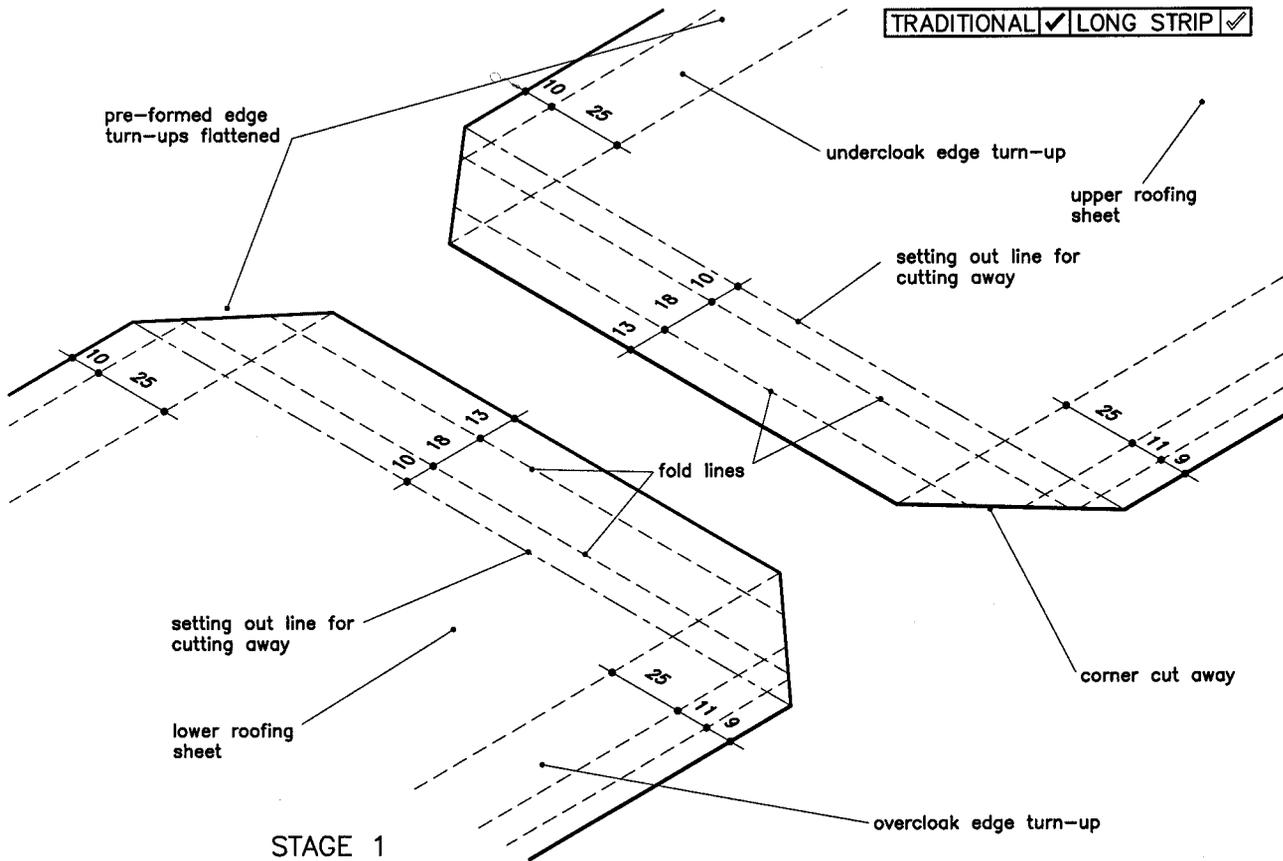
This detail is mainly for use in Traditional roofing because it allows no longitudinal movement. However, it is sometimes used in Long Strip roofing where the form of the roof requires a transition from a straight to a curved section (see Fig 15b).

It can also be used in Long Strip if the appearance of cross welts is required. In this case, from the point of view of acceptable bay sizes, the presence of the cross welts is ignored; and lateral joints for movement must be provided, or overall bay sizes limited, in accordance with Table L. Sliding clips, of course, must also be provided as shown on Table L (p11).

When pre-patinated copper sheets have been specified, it is better to use this pre-formed cross welt as some of the patina will be lost in the hand-forming (see Fig 15a). The pre-formed version also tends to give cleaner lines.

In both Traditional and Long Strip roofing, the double-lock cross welt can only be used with roof pitches at and over 20degrees. If sealed they can be used with roof pitches down to 6degrees.

Temper: quarter- or half-hard copper must be used, as no clip is possible at centre of bay.
Thickness: 0.6mm or 0.7mm



Stage 1
Flatten pre-formed edge turn-ups (see Fig 14) of overcloak and undercloak at the ends of the sheets or trays to be joined, to allow marking out and cutting.

Cut away the corners to reduce the bulk of copper layers that will occur otherwise at the intersection with the standing seam. Use straight snips for cutting.

Form open double-lock welts along fold lines, to the ends of both sheets. This can be done with a special folding machine or by bending the copper around a 4mm thick aluminium section.

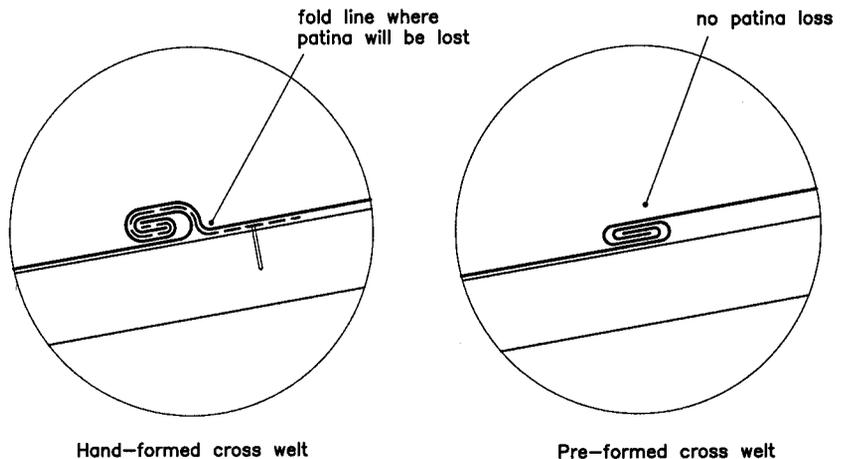


Fig 15a
Cross welt for pre-patinated sheet

TRADITIONAL ✓ LONG STRIP ✓

Stage 2
Slide the open welts together and adjust the sheets until they line up.

Dress seam down flat to the surface of the substrate to complete the joint. To make provision for bringing the standing seams upright neatly, it will be necessary to indent the cross welt at the folding point with the blade head of a hammer, to start the fold.

Reform the edge turn-ups flattened for Stage 1 and complete the double-lock standing seams (see Figs 1 and 2).

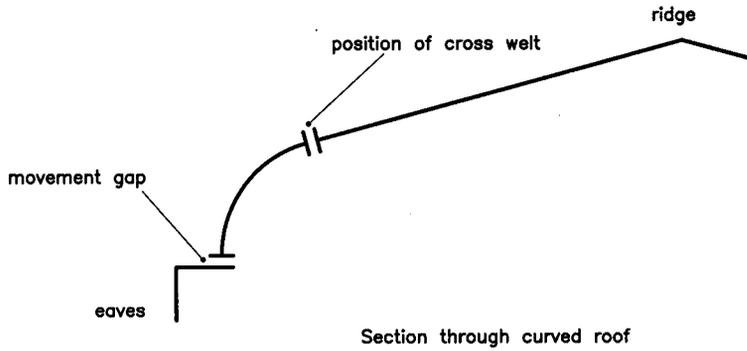
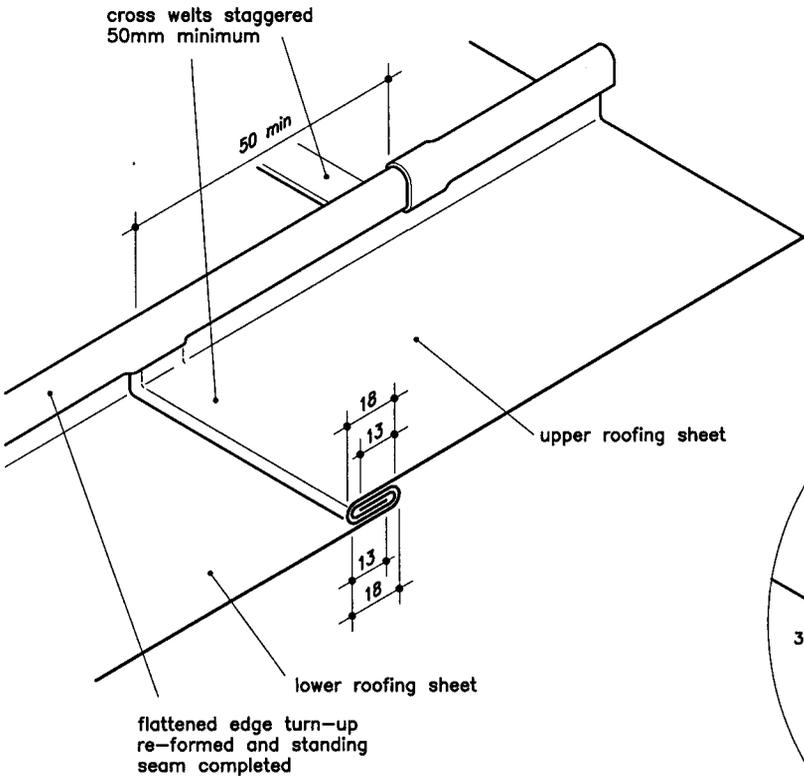
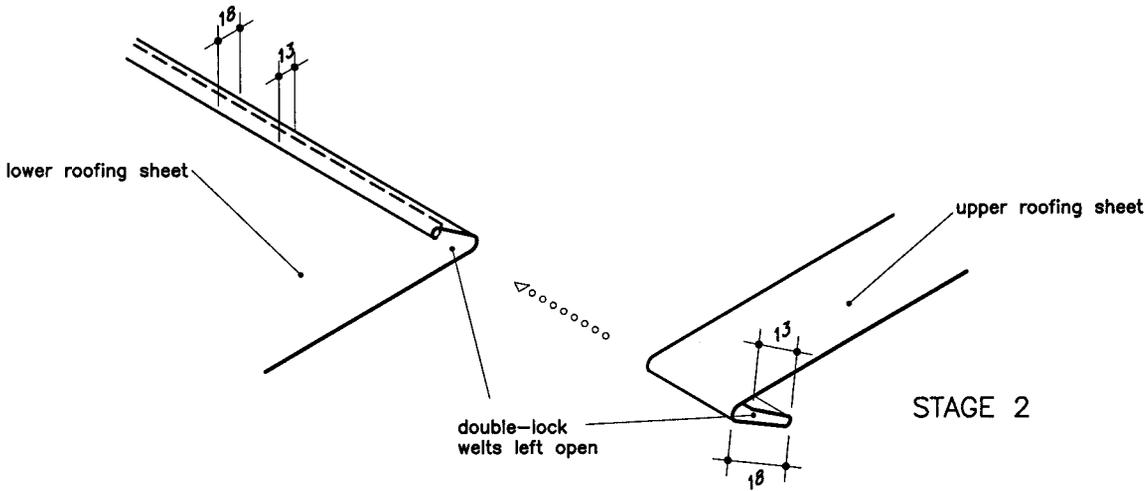


Fig 15b
Cross welt as transition from straight to curved tray
TRADITIONAL ✓ LONG STRIP ✓



Stage 3
The cross welt is complete.

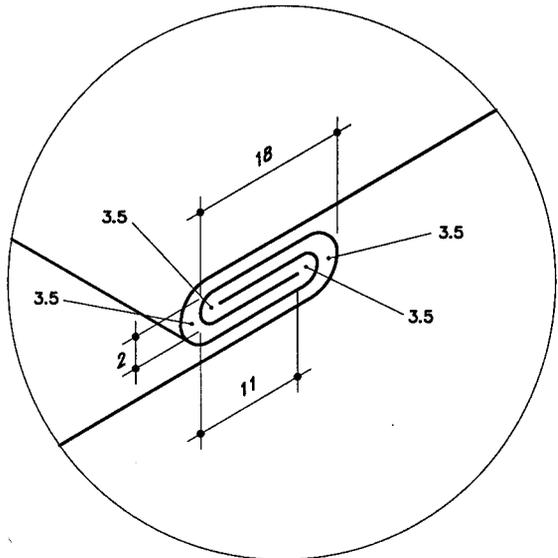


Fig 16 Double-lock standing seam junction with drip-step

This detail is one of the three methods of providing movement joints in Long Strip roofing. The lap-lock cross welt (see Fig 17) and the fillet drip (see Fig 16a) are the others.

With both versions of the dog-eared upstand, the minimum step height acceptable for drip-steps and fillet drips is 50mm.

The Pinched seam upstand can also be used, but the minimum step height must be increased to 100mm (see Fig 4f). This is because there is a projecting upstand seam to be accommodated, and the weathering of this with a downstand to the lining plate requires 50mm minimum of cover.

In Long Strip roofing lateral joints for movement must be provided, or overall bay sizes limited, in accordance with Table L. Sliding clips, of course, must also be provided as shown on Table L (p11).

Sometimes in Long Strip roofing the Traditional appearance of double-lock cross welts is required. This is described with Fig 15 (p52).

In Traditional roofing drip-steps can provide the lateral joints generally for roofs with a minimum pitch of 3degrees (see Tables D and F). Drip-steps will be required at 1700mm centres, and their minimum step height will be 50mm (see Fig 4e). The same applies if fillet drips are used instead but these can only be used for roof pitches at and over 14degrees, or 25degrees if the Pre-formed straight dog-eared upstand is used. The 10mm movement gap shown on the drawing at the end of the upper roofing sheet is not required for any of these situations.

Alternatively the Turned-down seam upstand can be used instead (see Fig 3c).

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm

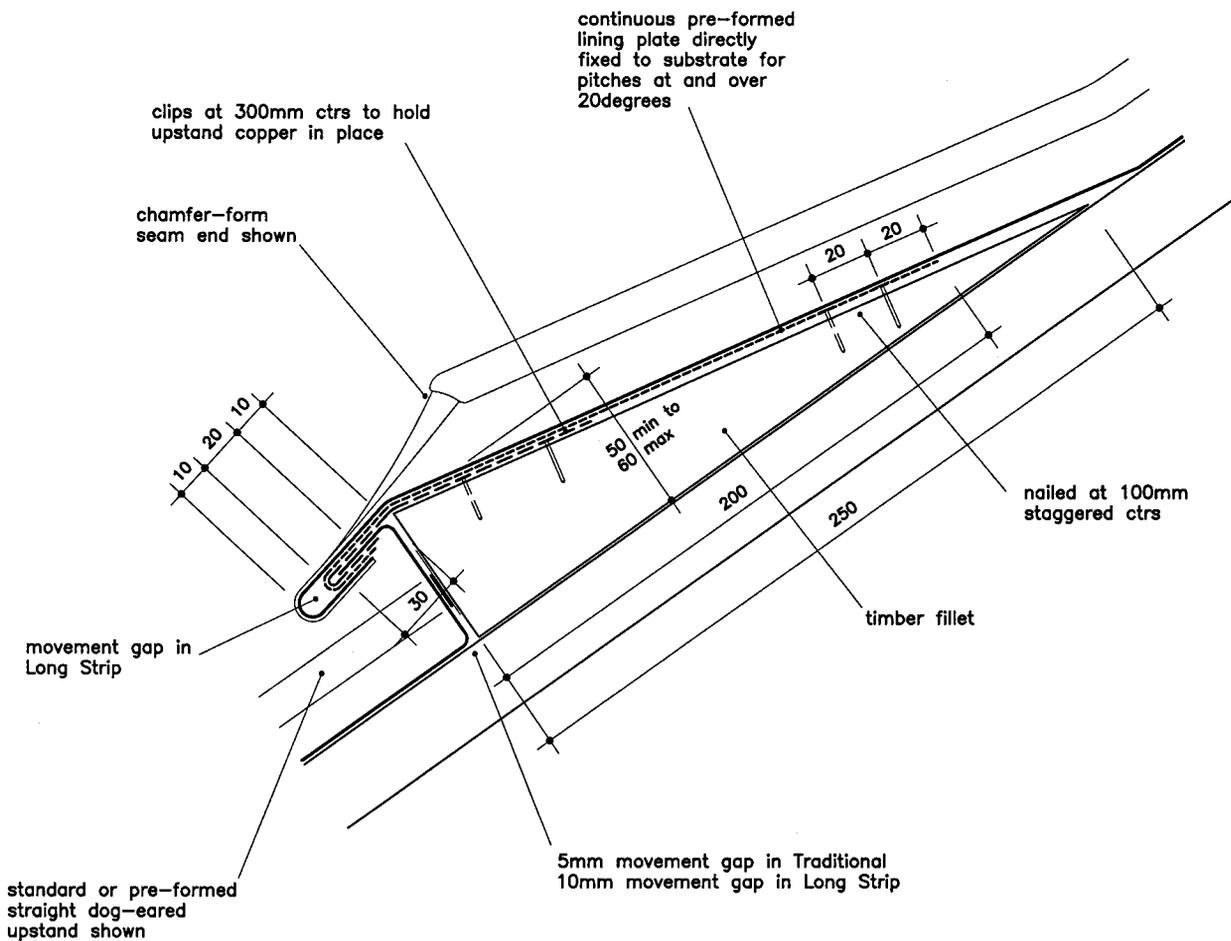


Fig 16a
Fillet drip

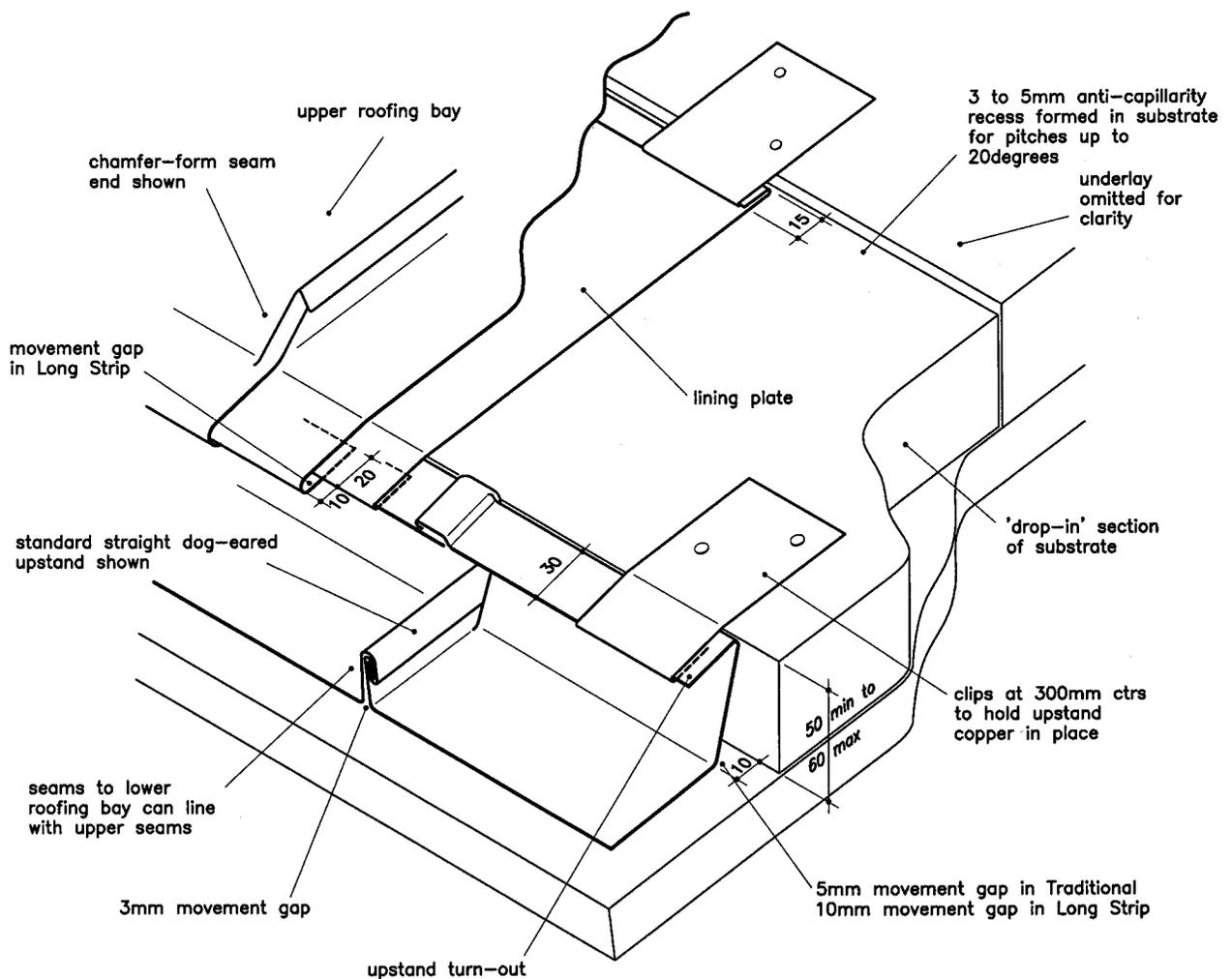
TRADITIONAL LONG STRIP

TRADITIONAL ✓ LONG STRIP ✓

Stage 1

Complete the Straight dog-eared upstand (see Figs 9 and 10) against the drip-step with a 30mm turn-out and a 10mm movement gap at its base. The Standard version requires a 'drop-in' section of substrate. For pitches up to 20degrees a 3mm to 5mm anti-capillarity recess (see also Fig 4e) needs to be accommodated in this section.

The Pre-formed straight dog-eared upstand can only be used with roof pitches at and over 25degrees. It requires no 'drop-in' section of substrate, and no recess at that pitch.



Stage 2

Clip the upstand turn-out to hold it in position for the fixing and turning under of the lining plate. The lining plate will project 30mm minimum from the top edge of the drip-step, so that the turn-under of the upper roofing sheet can engage it by 20mm and still have 10mm for movement.

Fig 17 Double-lock standing seam junction with lap-lock cross welt

This detail is one of the three methods (see Figs 16 and 16a) of providing movement joints in Long Strip roofing. It has the advantages of being less apparent and does not require any change in the substrate.

In Long Strip roofing lateral joints for movement must be provided, or overall bay sizes limited, in accordance with Table L. Sliding clips, of course, must also be provided as shown on Table L (p11).

It can only be used for roof pitches at and over 10degrees.

Temper: quarter- or half-hard
Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP

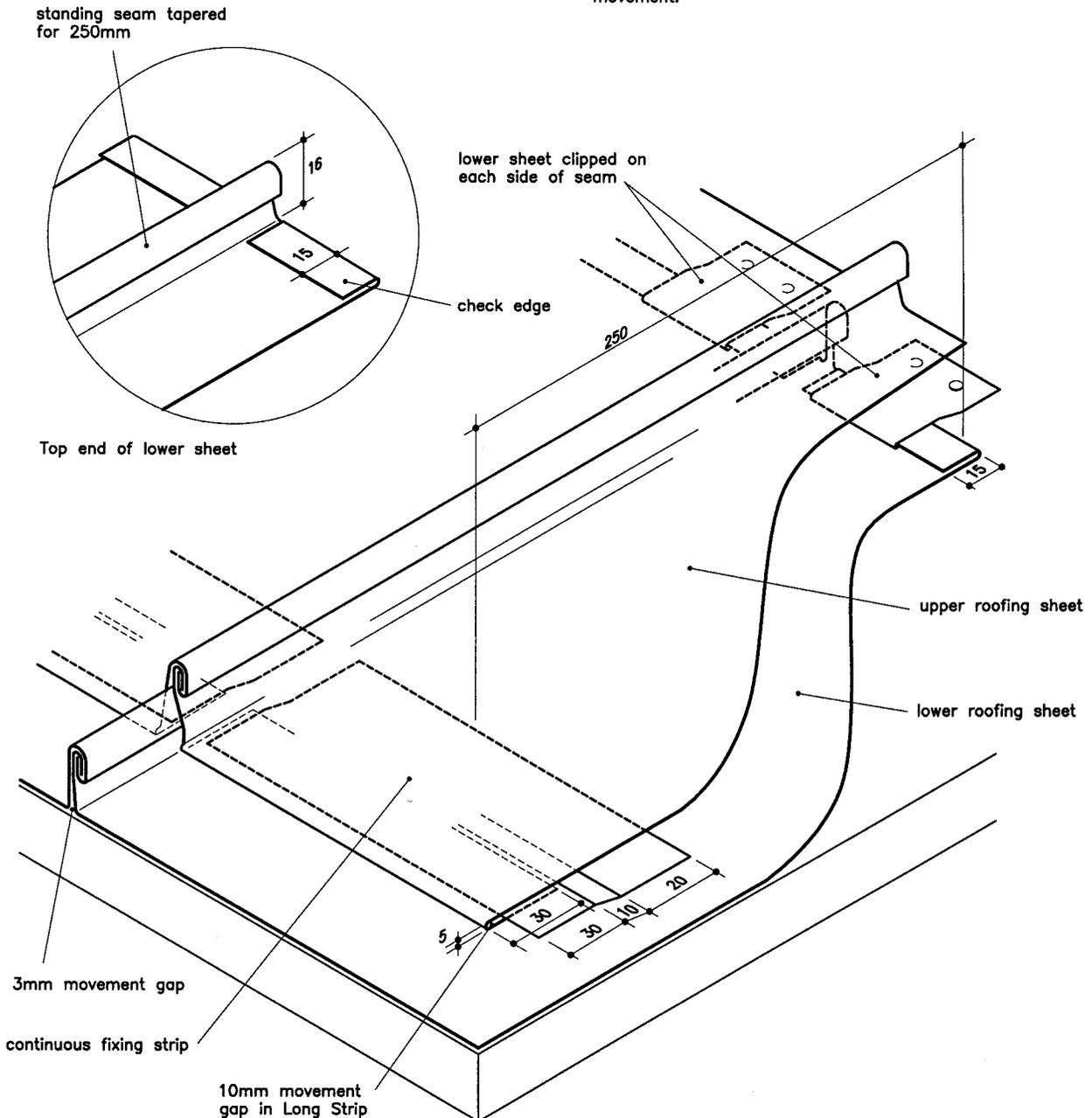


Fig 18 Double-lock standing seam at external corners

This detail uses a sweep type detail called the 'graduated standing seam'. The undercloak is formed as the Sweep standing seam upstand (see Fig 7), using curved cutting and a dog-ear fold to achieve the sweep. The overcloak has no folding but is simply cut from the sheet with the shape of the curve. This is then folded over the undercloak to make a double-lock standing seam in the usual way.

The run of the seam is kept to a minimum, say 450mm down from the abutment, by introducing a double-lock cross welt (see Figs 14 and 15). This is for two reasons. Firstly, the seam has to be folded over to retain the return upstand against the abutment, thus restricting lateral movement. Secondly, it reduces the wastage that results from the cutting away of the sheet edges, necessary to form the sweep.

The abutment corner with its graduated standing seam affects the spacing of the adjacent bays. The layout of the bays, therefore, needs to be thought out beforehand. Refer to Tables E (p8) and J (p10) for bay widths. Forming the seam takes up about 125mm.

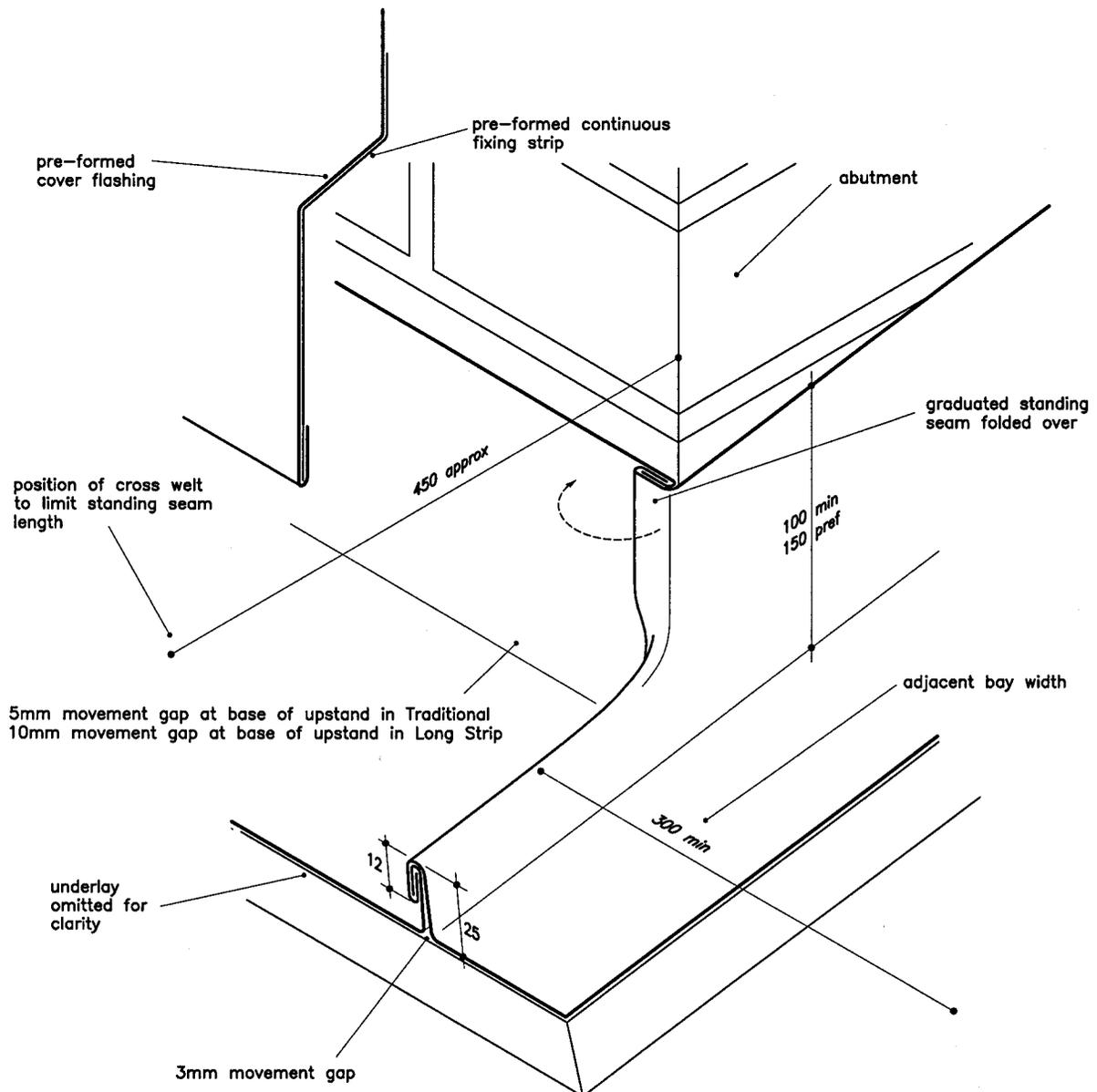
In Long Strip roofing, the Pinched seam upstand (see Figs 8 and 12) is used where the other standing seams meet the general run of the abutment. The cover flashing detail (see Fig 12a) needs to allow 10mm for longitudinal movement.

In Traditional roofing, the Sweep standing seam upstand (see Fig 7) or the Turned-down seam upstand (see Fig 11) is used where the other standing seams meet the general run of the abutment. In both cases the seam is folded flat against the abutment. For cover flashing details see Figs 11a, 11b, 11c (p46) and 12b (p48). Stepped cover flashings are shown in Figs 18a, 18b and 18c (p59).

Temper: Roofing sheet; easier in soft or quarter-hard, but can be done in half-hard. Pre-formed cover flashing etc; half-hard.

Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP



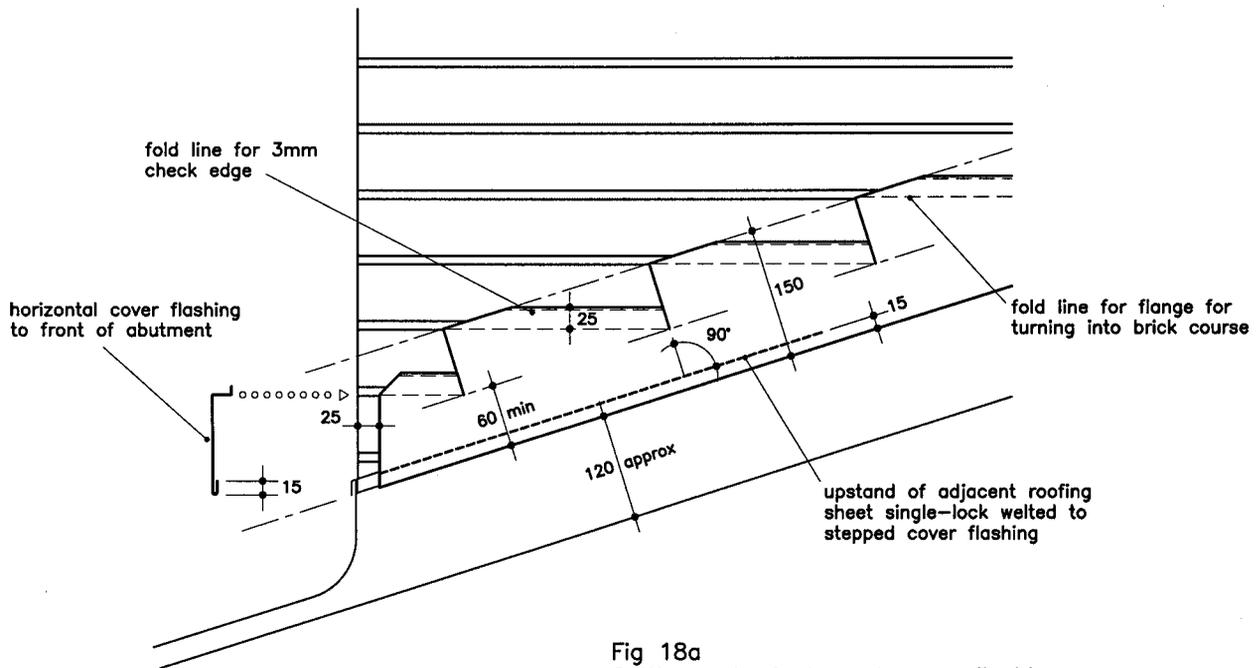


Fig 18a
Setting out of stepped cover flashing

TRADITIONAL ✓ LONG STRIP ✓

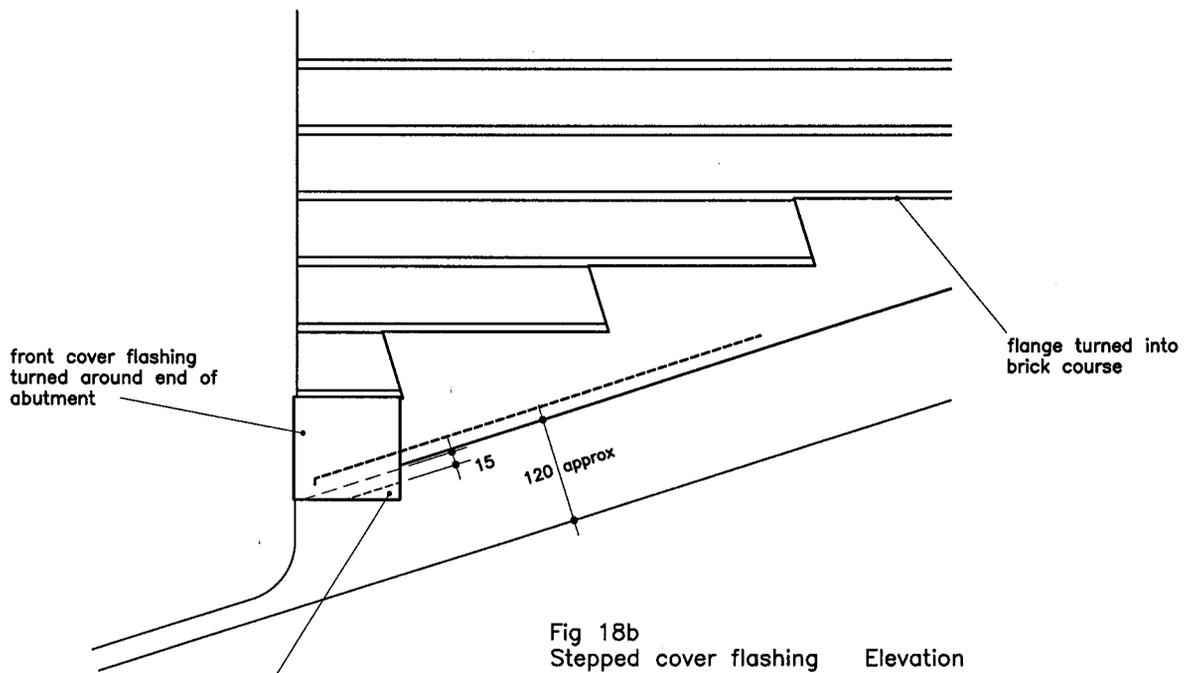


Fig 18b
Stepped cover flashing Elevation

TRADITIONAL ✓ LONG STRIP ✓

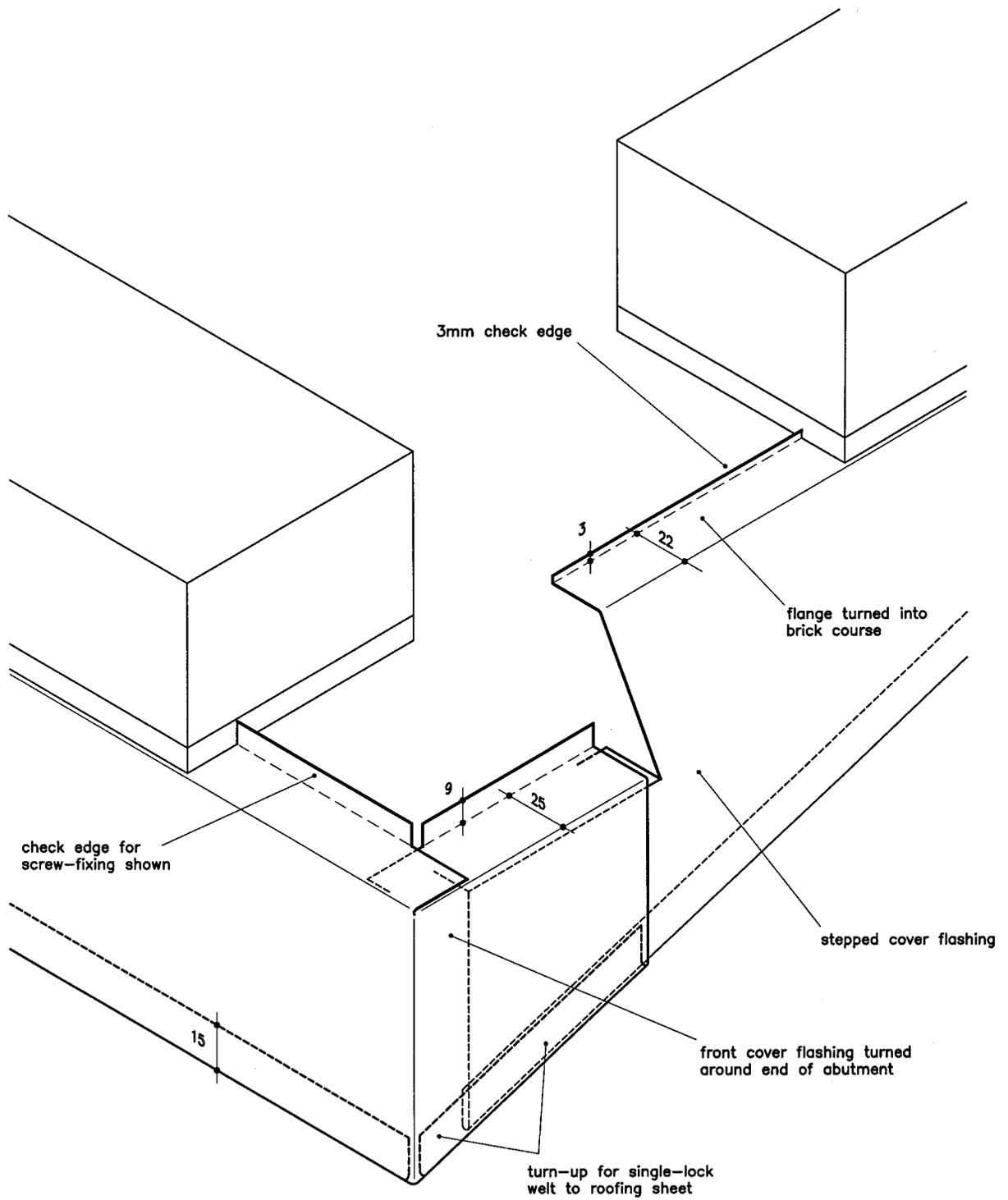


Fig 18c
Stepped cover flashing junction with horizontal flashing

TRADITIONAL ✓ LONG STRIP ✓

Fig 19 Double-lock standing seam to batten ridge or hip

Because the straight dog-eared upstand can be formed down to a minimum height of 40mm (but more usually 50mm), it is ideal where standing seams are required to abut battens. It is the preferred method for ridges and hips on warm roofs, and for hips on cold roofs. The detail also separates the copper on different roof slopes, allowing independent movement.

The Preformed straight dog-eared upstand can only be used where roof pitches are at or over 25degrees.

In Long Strip roofing the base of the upstand needs to allow 10mm for longitudinal movement. Similarly the ridge capping turn-under needs to allow 10mm for movement.

If the roof pitch is over 47degrees the height of the batten will need to be increased so that the upstand detail can be formed properly.

With standing seams at hips the overcloak must be folded over in the direction of down the hip ie in the direction of fall.

Temper: Straight dog-eared upstand; soft, quarter- or half-hard. Pre-formed capping; half-hard.
Thickness: 0.6mm or 0.7mm

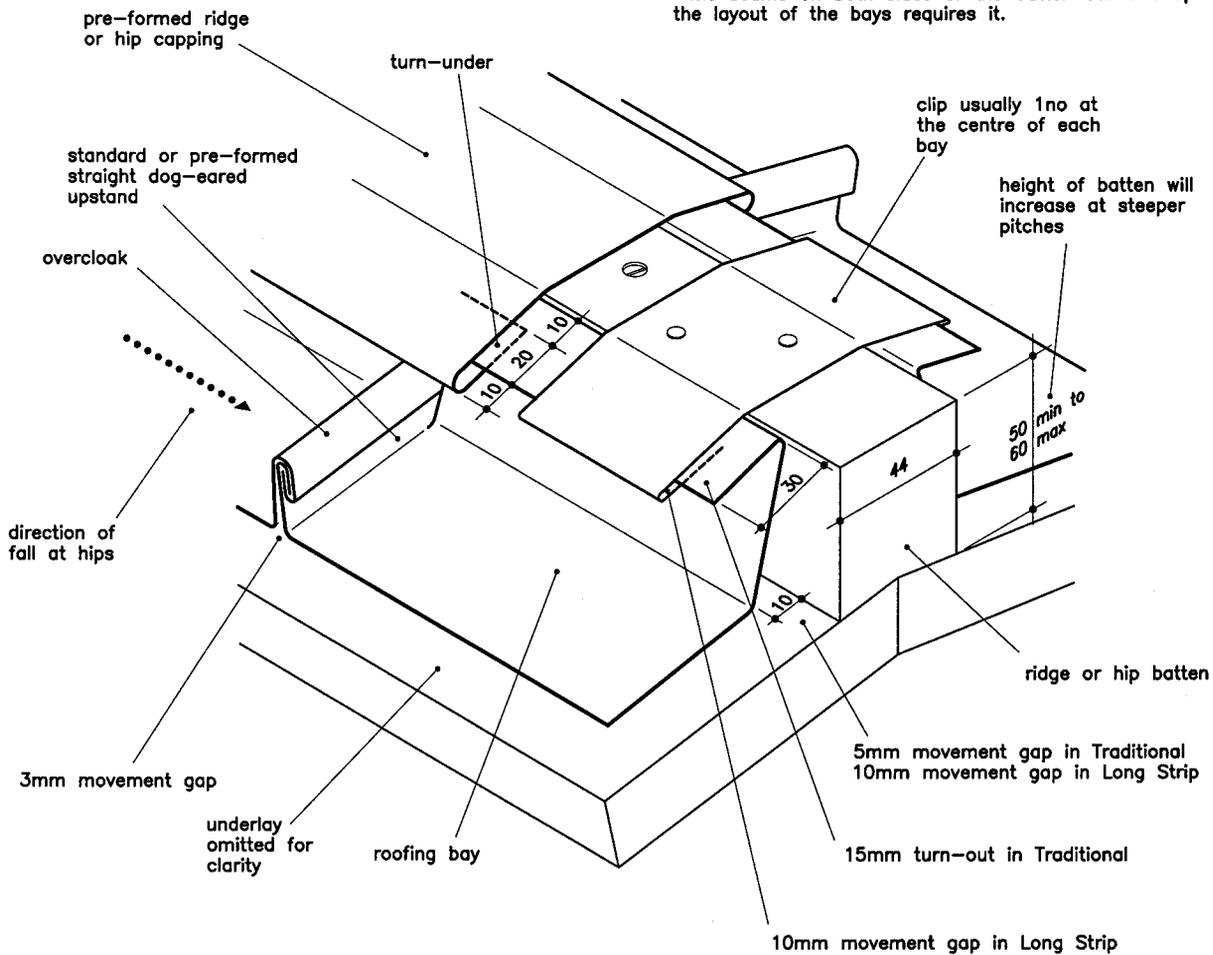
TRADITIONAL ✓ LONG STRIP ✓

Stage 1

Form the chosen version of a straight dog-eared upstand (see Figs 9 and 10) on each side of the ridge or hip. If the Standard version is chosen the batten will be dropped in afterwards; if the Preformed version, the upstands can be formed with the batten in place.

The batten is screw-fixed with the screws well countersunk.

The seams on both sides of the batten can line up if the layout of the bays requires it.



Stage 2

Clip the 30mm turn-out at the head of each roofing bay to the batten. Usually 1no clip is provided, located at the centre of each bay.

Stage 3

Hook the pre-formed batten capping around the turn-outs to complete the detail.

Joints in ridge cappings are described with Fig 23 (p64).

Fig 20 Double-lock standing seam to ventilated ridge

The detail is quite involved, but is necessary for roofs which require ventilating to avoid the risk of condensation.

In sheltered conditions it is possible to omit the clips and simply nail the copper upstand to the substrate upstand.

Joints in ridge cappings are described with Fig 23 (p64).

Temper: Pinched seam upstand; soft, quarter- or half-hard.
Pre-formed capping; half-hard.
Thickness: 0.6mm or 0.7mm

Stage 1

Fix the substrate upstands at the ridge to timber blockings off the the roof structure. Nail the insect mesh at 100mm centres to the top of the upstands. Similarly screw the 100mm long timber spacer-blocks, placed over the mesh at 1m approximate centres.

Stage 2

Nail clips for the roofing copper to the substrate upstand, at 1no or 2no per bay. Form Pinched seam upstand (see Fig 8), and secure the turn-out with the clips.

Stage 3

Screw the weathered timber ridge-section to the spacer-blocks, and nail the continuous fixing strips in place. Joints in the continuous fixing strip are butt jointed. Finally hook the pre-formed ridge capping around the continuous fixing strip on one side, and complete the fixing with seaming pliers on the other.

TRADITIONAL ✓ LONG STRIP ✓

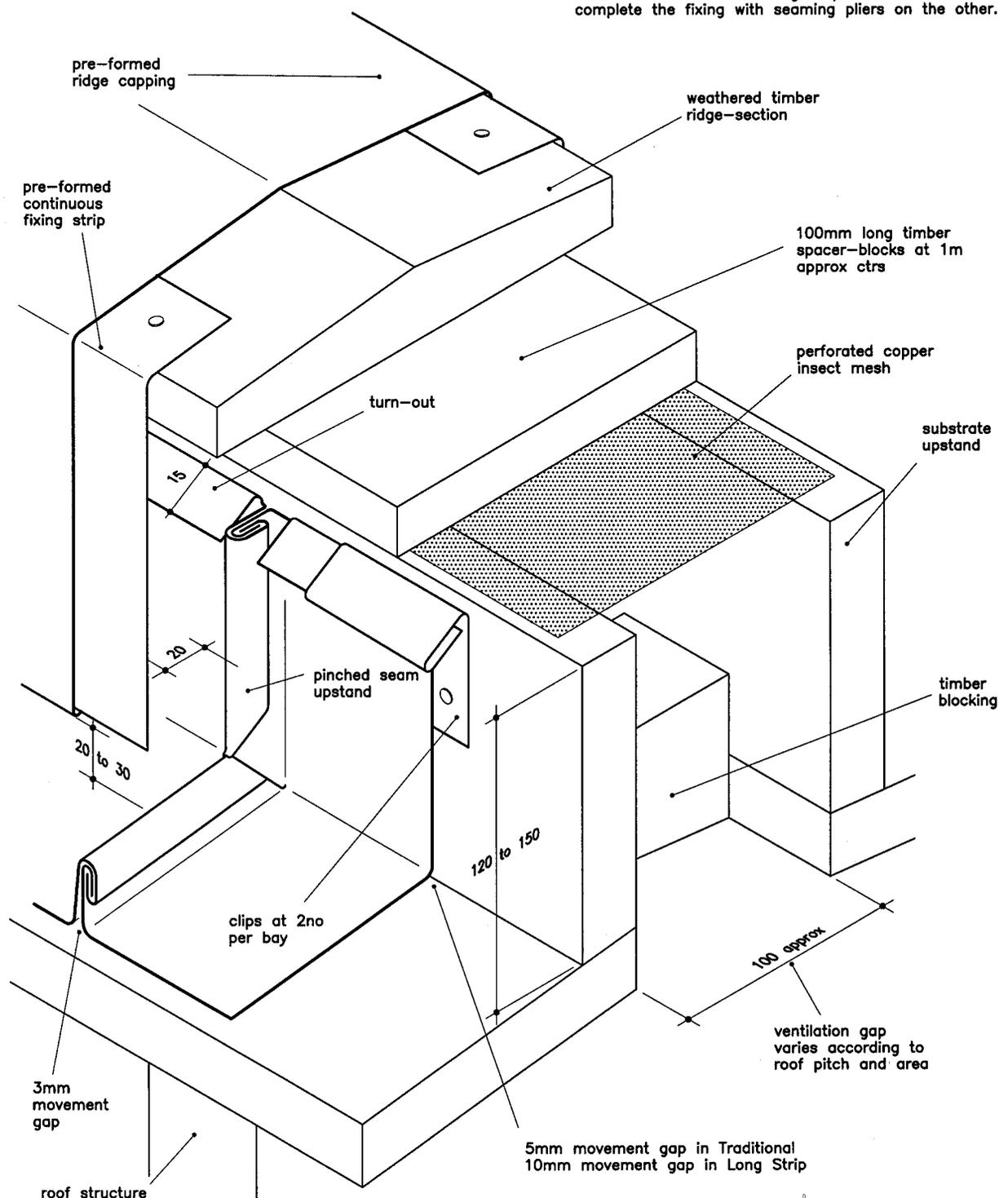


Fig 21 Double-lock standing seam to T-seam ridge

This detail is almost identical in appearance to a batten ridge (see Fig 19) and, because it is difficult to keep straight, the batten ridge is usually preferred. Like the batten type, it can also be used for hips. The minimum upstand that can be formed is 40mm, but is more usually 50mm.

In Long Strip roofing, a 10mm movement gap is provided between the base of the upstand and the clip; and where the capping engages the turn-out.

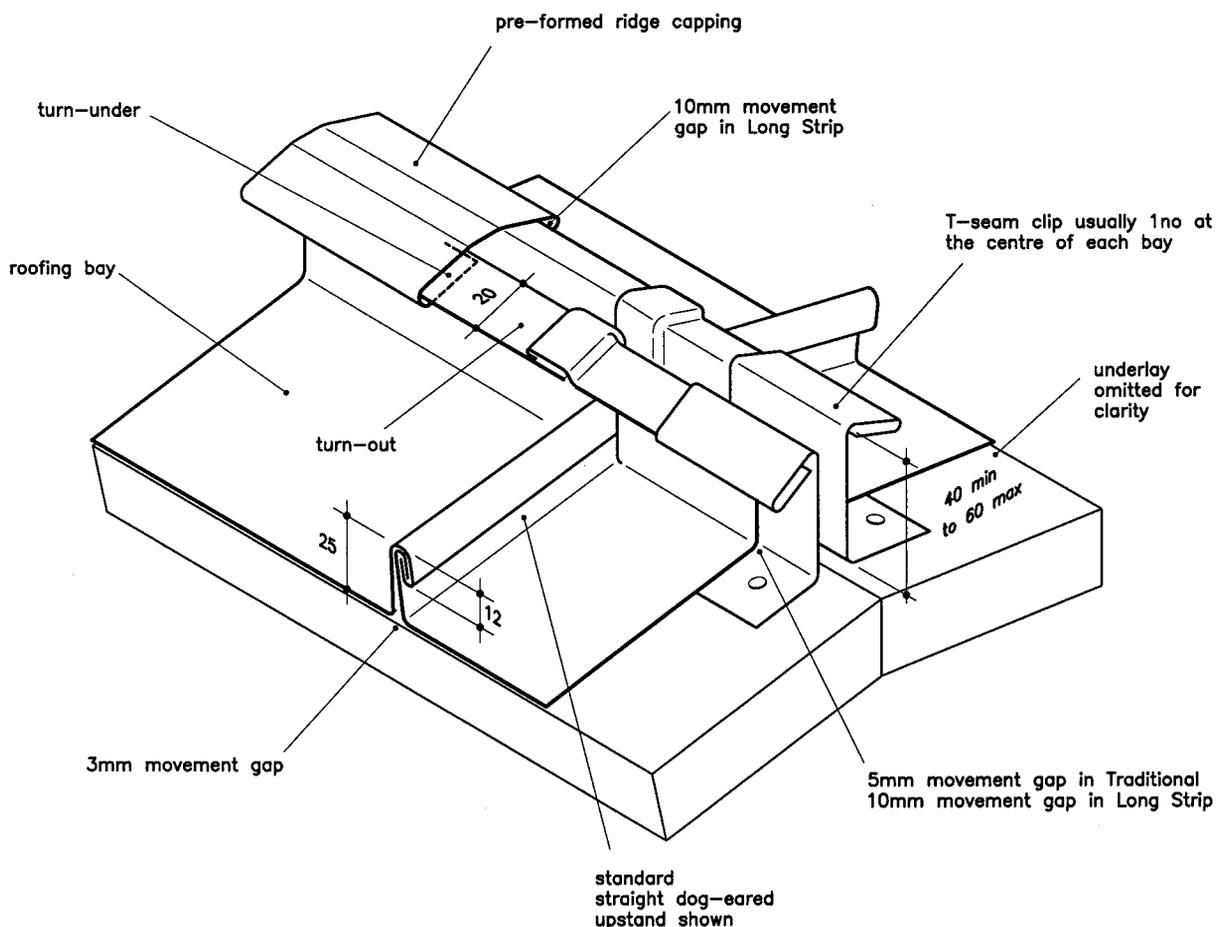
Single-lock welts could be used instead of laps to joint the ridge capping, but they need a lot of care to finish neatly (see Fig 11b).

The minimum roof pitch for the Pre-formed straight dog-eared upstand is 25degrees.

Temper: Straight dog-eared upstand; soft, quarter- or half-hard. Pre-formed capping; half-hard.
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

Stage 1
Fix T-seam clips along the ridge, at 1no per bay located at the centre. Form Standard or Pre-formed straight dog-eared upstand (see Figs 9 and 10), with a 20mm turn-out at the head of each roofing bay.



Stage 2
Hook the pre-formed ridge capping around the turn-outs on one side, and complete the fixing with seaming pliers on the other. Joint the ridge capping with lap joints at 2m maximum centres: either 50mm with a check edge and sealed (see Fig 12b), or 150mm simple laps (see Fig 11a).

Fig 22 Double-lock standing seam to standing seam ridge

This ridge detail can only be used on small roofs, say 3m x 3m maximum, because it restricts movement in the copper sheet. Its use therefore is very limited, but it is useful for domers etc.

An alternative shown in Fig 22a below has a dressed down single-lock welt forming the ridge. This can only be used in sheltered positions. A variation with the double-lock standing seam ridge turned down is possible for more exposed situations.

Temper: Turned-down seam upstand; soft or quarter-hard, preferably. If half-hard is used the sides of the copper sheet must be cut tapered to the start of the splay (see Fig 11).

Thickness: 0.6mm or 0.7mm

Stage 1

Form turned-down seams to the roofing bays (see Fig 11), starting with the undercloak side. The roofing sheets should be taken 35mm beyond the ridge line, and then folded back carefully to match the roof pitch of the opposite slope. Use seaming pliers.

Stage 2

Form turned-down seams to the roofing bays on the overcloak side, taking the roofing sheets beyond the ridge line by 45mm. These will now be lying on the undercloak upstand folded back in Stage 1.

Stage 3

Fold both overcloak and undercloak back upright on the ridge line. Then form the standing seam joint along the ridge using hand seaming irons, or a seaming 'H' iron and a seaming mallet.

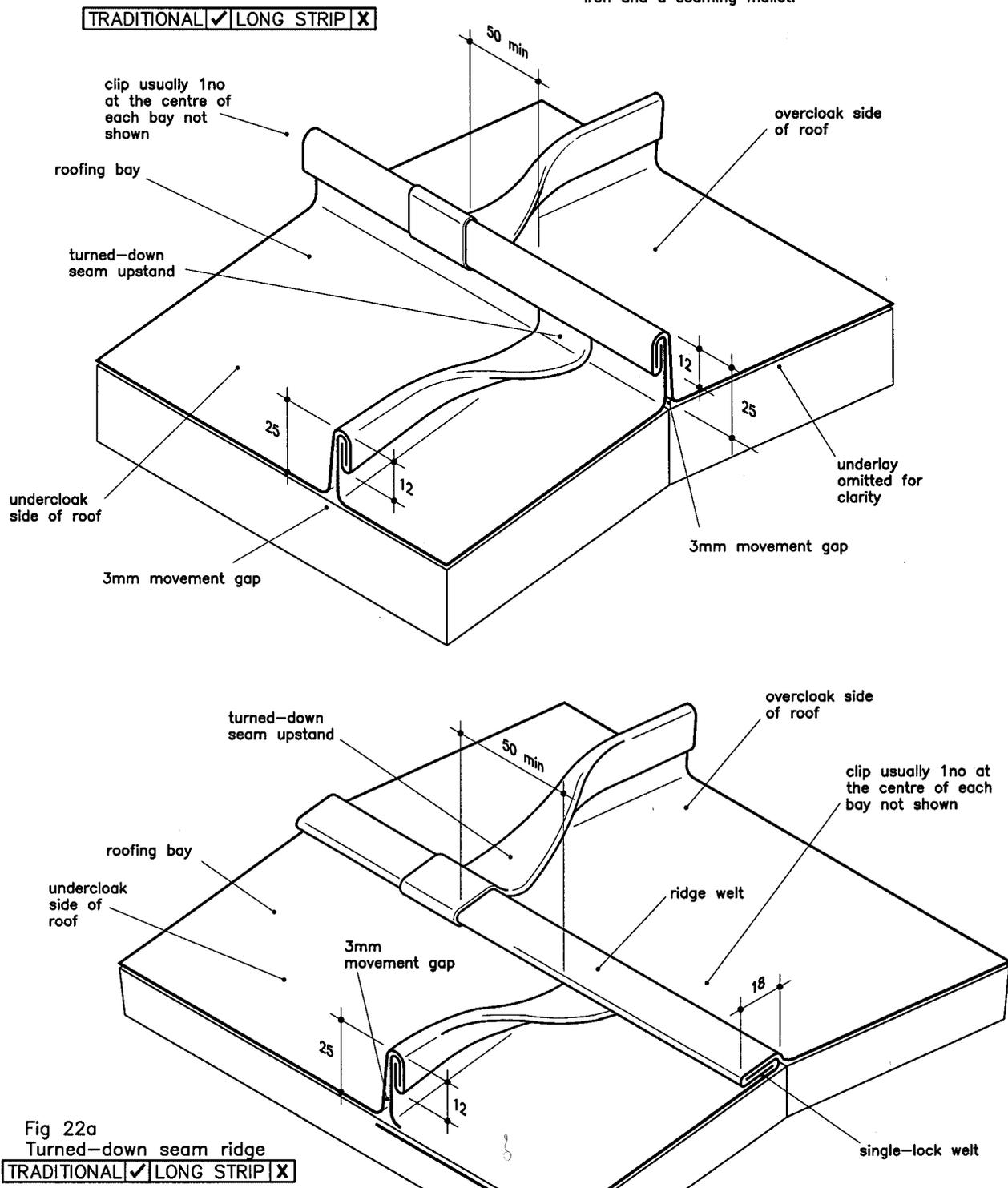


Fig 23 ... to ventilated monopitch roof over direct-fixed cladding

This detail is necessary for roofs which require ventilating to avoid the risk of condensation.

In Long Strip roofing (see Fig 23a below) the detail is basically the same but the roofing clips are formed to allow longitudinal movement.

Joints in fascias and ridge cappings are the same as for cover flashings. They should be at 2m maximum centres. They can be made with lapped joints: either 150mm or 50mm with a check edge and sealed; or with single- or double-lock welts, according to exposure and depth (see Figs 12b, 11a, 11b and 11c). With fascias where the depth is over 100mm, and with deep cappings such as that shown in Fig 20, welted joints are recommended to hold the copper neatly in line. The return folds of the welts are pre-formed. Double-lock welts in particular will be difficult to form in this situation and should be pre-formed.

More detail on direct-fixed cladding is given in Fig 29 (p76)

Temper: Roofing sheet with straight dog-eared upstand; soft, quarter- or half-hard. Pre-formed fascia; half-hard.
Cladding: quarter- or half-hard.
Thickness: 0.6mm or 0.7mm

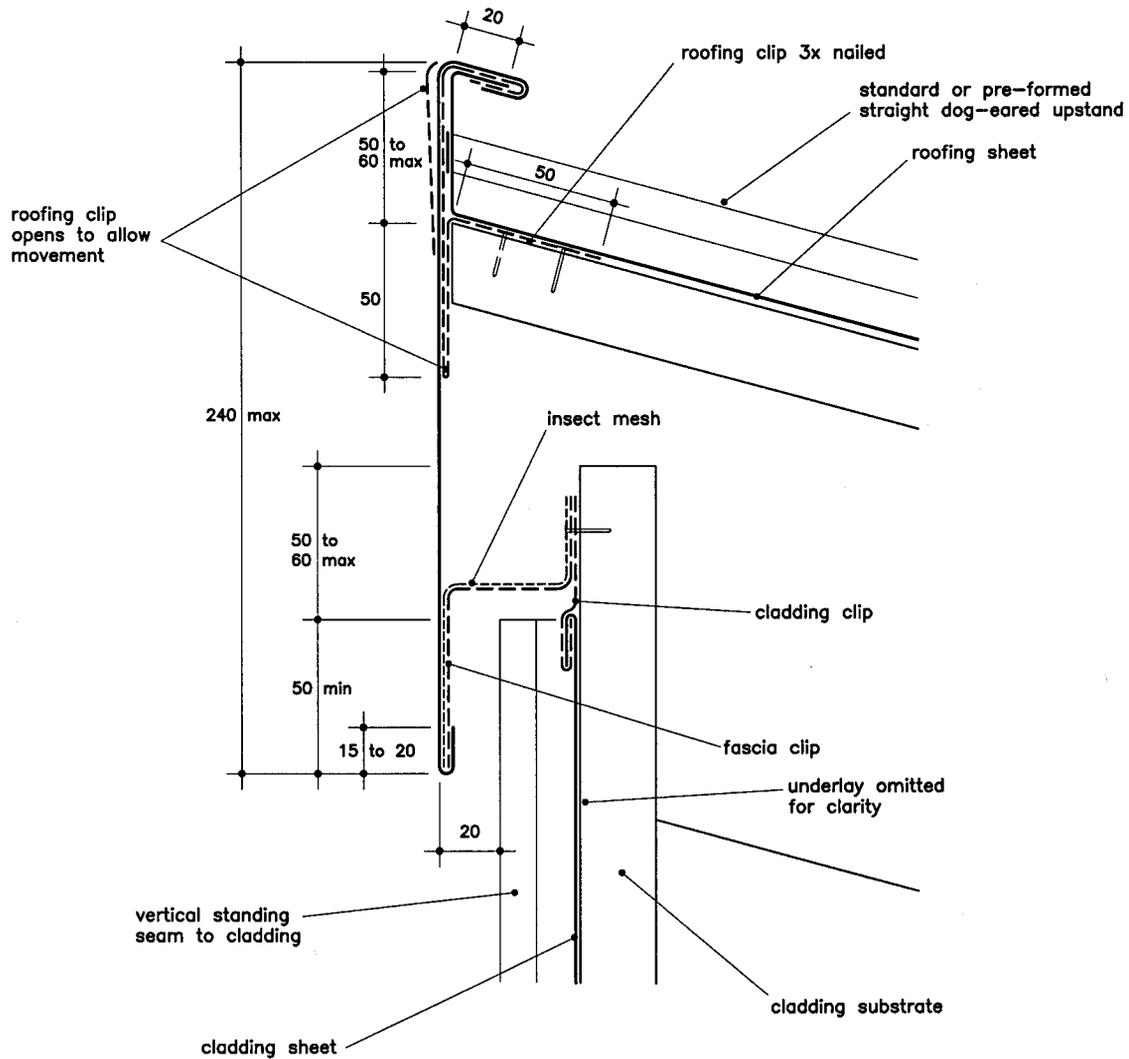


Fig 23a
Showing movement clip used in
Long Strip roofing

TRADITIONAL LONG STRIP

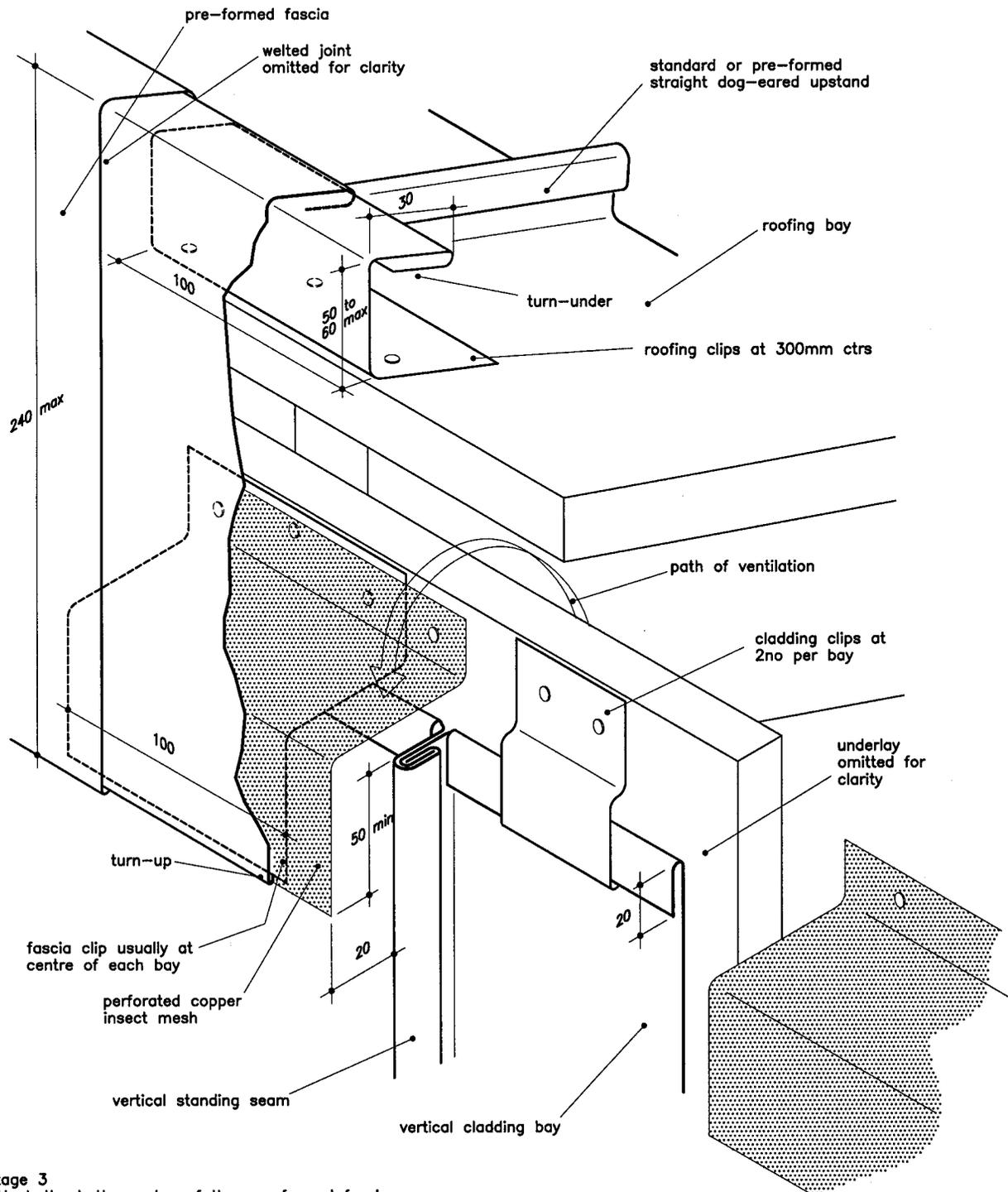
Stage 1

Finish off the direct-fixed vertical cladding with a 15 to 20mm turn-down, to engage cladding clips at 2no per bay. Use cranked seaming pliers. Nail pre-formed fascia clips to the substrate, at 1no per bay located at the centre. Then nail in place the pre-formed insect mesh at 100mm centres.

TRADITIONAL ✓ LONG STRIP ✓

Stage 2

Nail roofing clips at 300mm centres along the ridge line. Finish off the roofing sheets to engage these clips with the chosen version of a straight dog-eared upstand (see Figs 9 and 10).



Stage 3

Hook the bottom edge of the pre-formed fascia around the fascia clips; and, using seaming pliers, complete the fixing at the top with a turn-under to engage the upstand already formed.

Fig 24 ... with batten verge over direct-fixed cladding

Joints in fascias are described with Fig 23 (p64). Where the depth of a fascia exceeds 100mm, welded joints are recommended to hold the copper neatly in line.

In Long Strip roofing (see Figs 24c and 24d) the detail is basically the same but sliding clips are provided, fixed to the substrate, next to the verge batten. Note that this only applies outside the 'fixed clip zone' (see Table L, p11). Inside the fixed clip zone sliding clips are never provided.

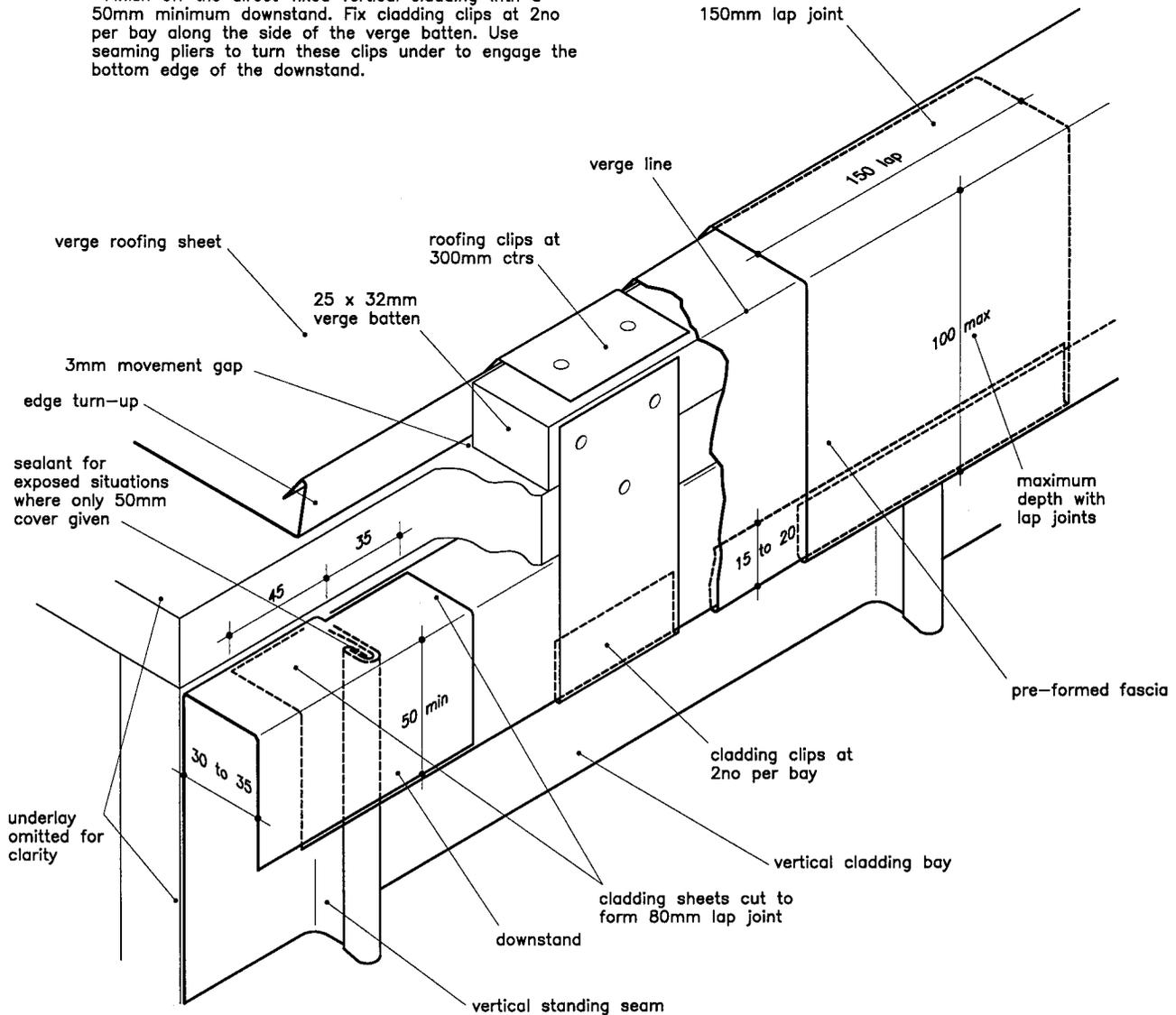
More detail on direct-fixed cladding is given in Fig 29 (p76).

Temper: Roofing sheet; soft, quarter- or half-hard.
Pre-formed fascia; half-hard. Cladding; quarter- or half-hard.
Thickness: 0.6mm or 0.7mm

Stage 2
Nail roofing clips at 300mm centres along the top of the verge batten. The clips will now lie over the edge turn-up of the verge roofing sheet.

TRADITIONAL ✓ LONG STRIP ✓

Stage 1
Finish off the direct-fixed vertical cladding with a 50mm minimum downstand. Fix cladding clips at 2no per bay along the side of the verge batten. Use seaming pliers to turn these clips under to engage the bottom edge of the downstand.



Stage 3
Hook the bottom edge of the pre-formed fascia around the bottom edge of the downstand. Complete the fixing at the top with a double-lock welt to the edge turn-up of the verge roofing sheet.

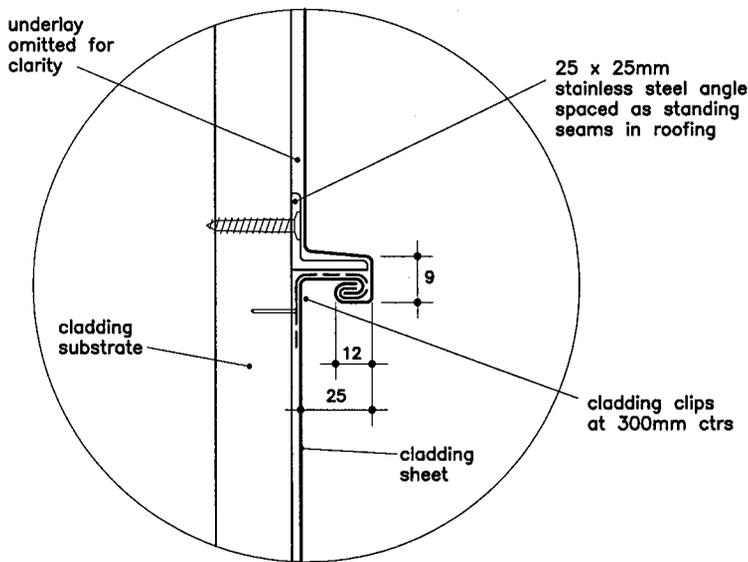


Fig 24a
Horizontal direct-fixed cladding joint
TRADITIONAL ✓ LONG STRIP ✓

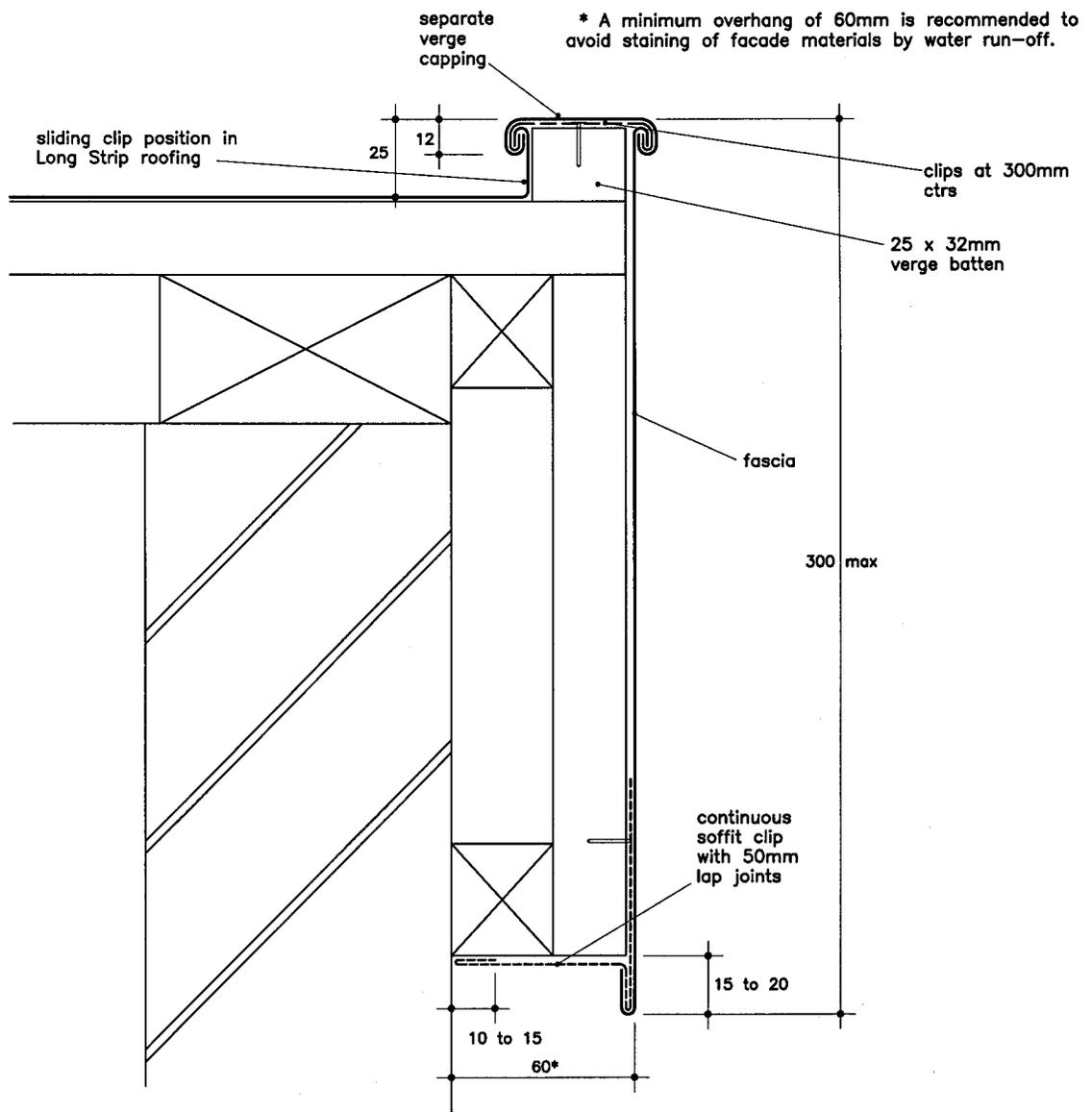


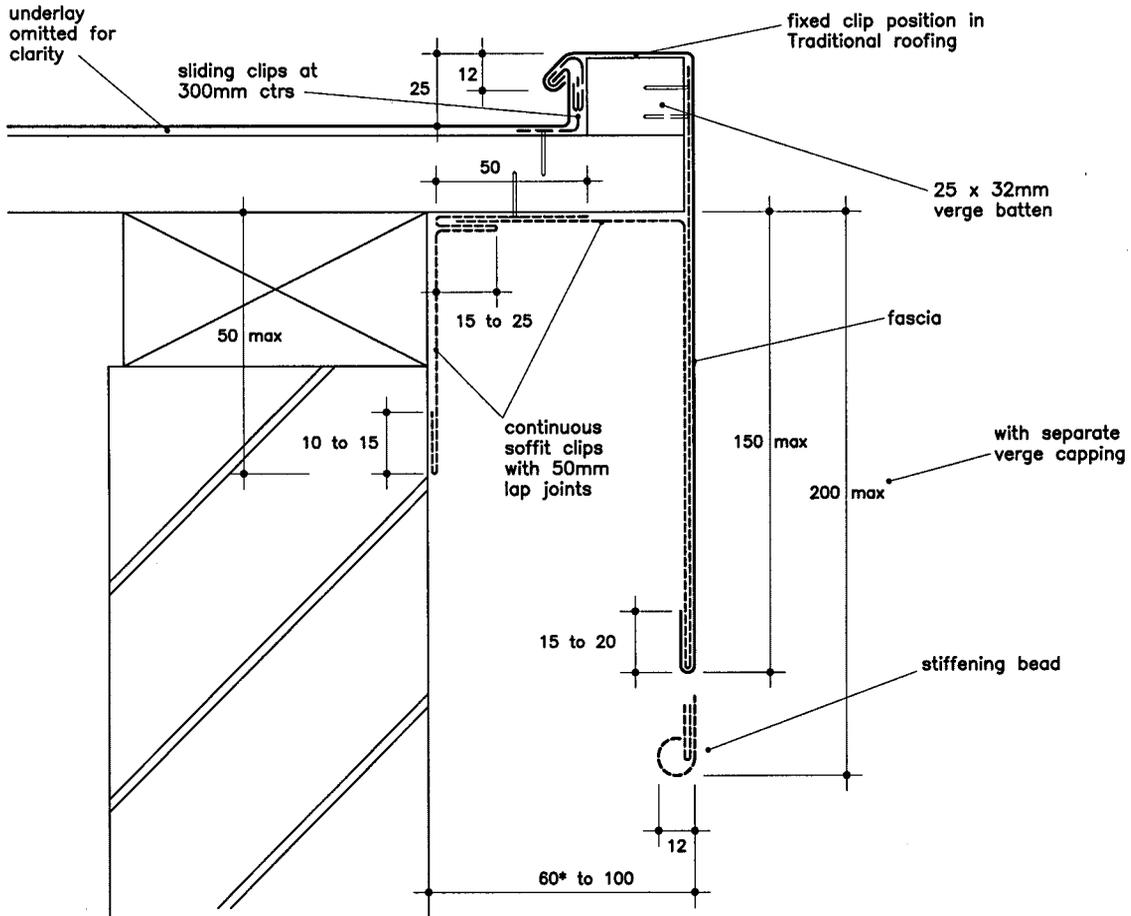
Fig 24b
Batten verge over brickwork with copper clad timber fascia up to
300mm deep, 60mm overhang
TRADITIONAL ✓ LONG STRIP ✓

Fig 24 ... with batten verge over direct-fixed cladding

Fig 24c

Batten verge over brickwork with copper fascia up to 250mm deep, maximum 100mm overhang

TRADITIONAL ✓ LONG STRIP ✓



* A minimum overhang of 60mm is recommended to avoid staining of facade materials by water run-off.

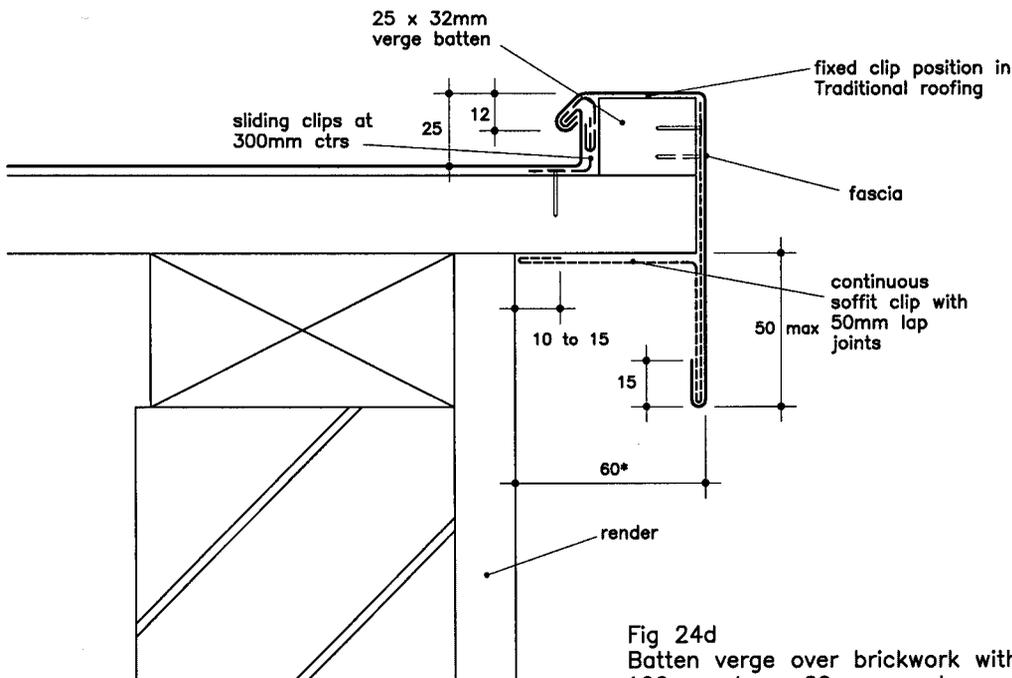


Fig 24d

Batten verge over brickwork with copper fascia up to 100mm deep, 60mm overhang

TRADITIONAL ✓ LONG STRIP ✓

Fig 25 ... with standing seam verge over brickwork

With the detail as drawn the wallplate and the substrate at the soffit will be exposed. Their finished appearance therefore needs to be considered. Alternatively the copperwork can be designed to finish the soffit gap. A minimum overhang of 60mm is recommended to avoid staining of facade materials by water run-off.

In Traditional roofing (see Figs 25b and 25c) the detail is basically the same but fixed clips are provided. Note that in Long Strip roofing sliding clips are only provided outside the 'fixed clip zone' (see Table L, p11). Inside the fixed clip zone sliding clips are never provided.

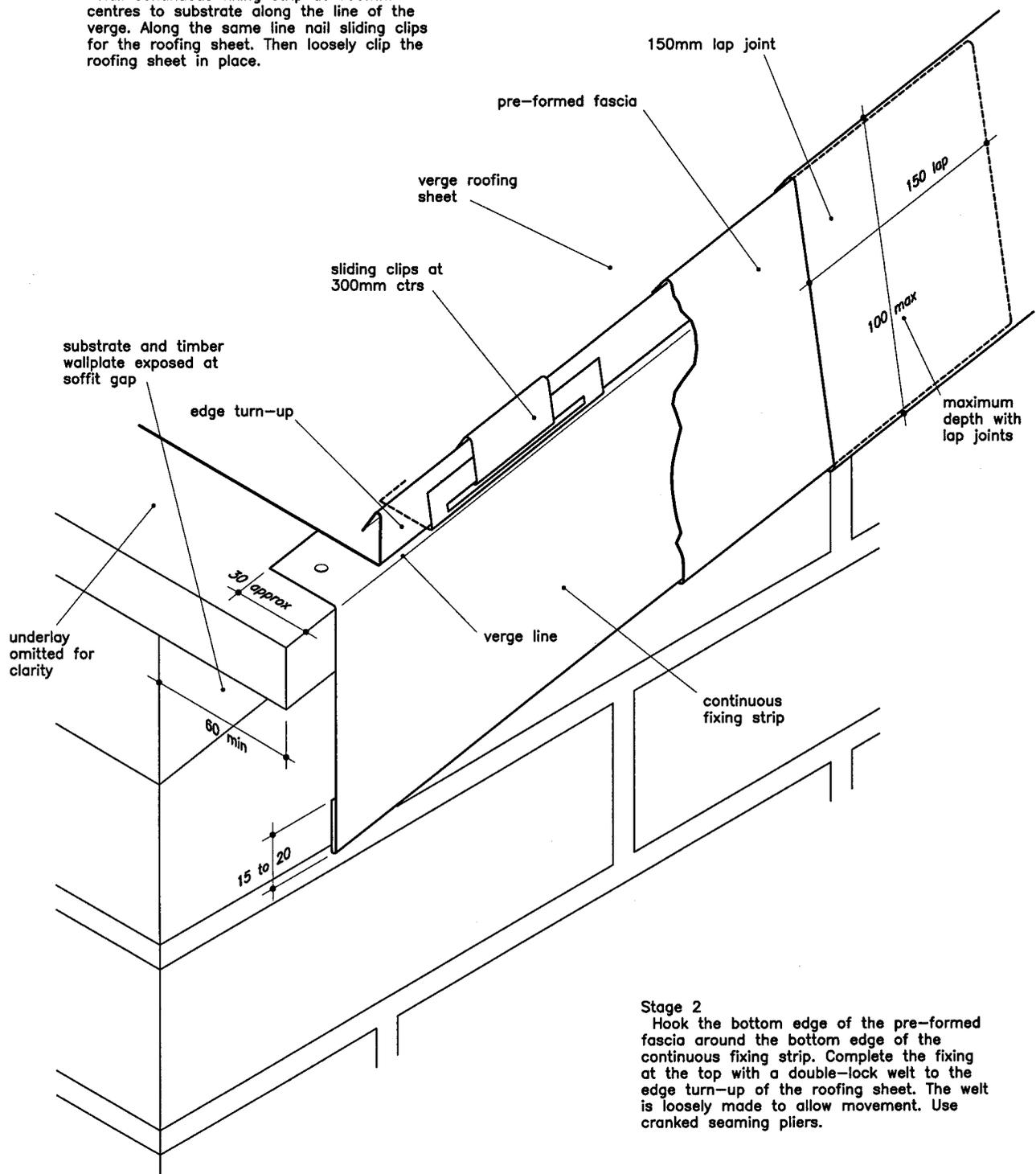
Joints in fascias are described with Fig 23 (p64). Generally, where the depth of a fascia exceeds 100mm, welted joints are recommended to hold the copper neatly in line.

Temper: Roofing sheet; soft, quarter- or half-hard.
Pre-formed fascia; half-hard. Cladding; quarter- or half-hard.
Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP

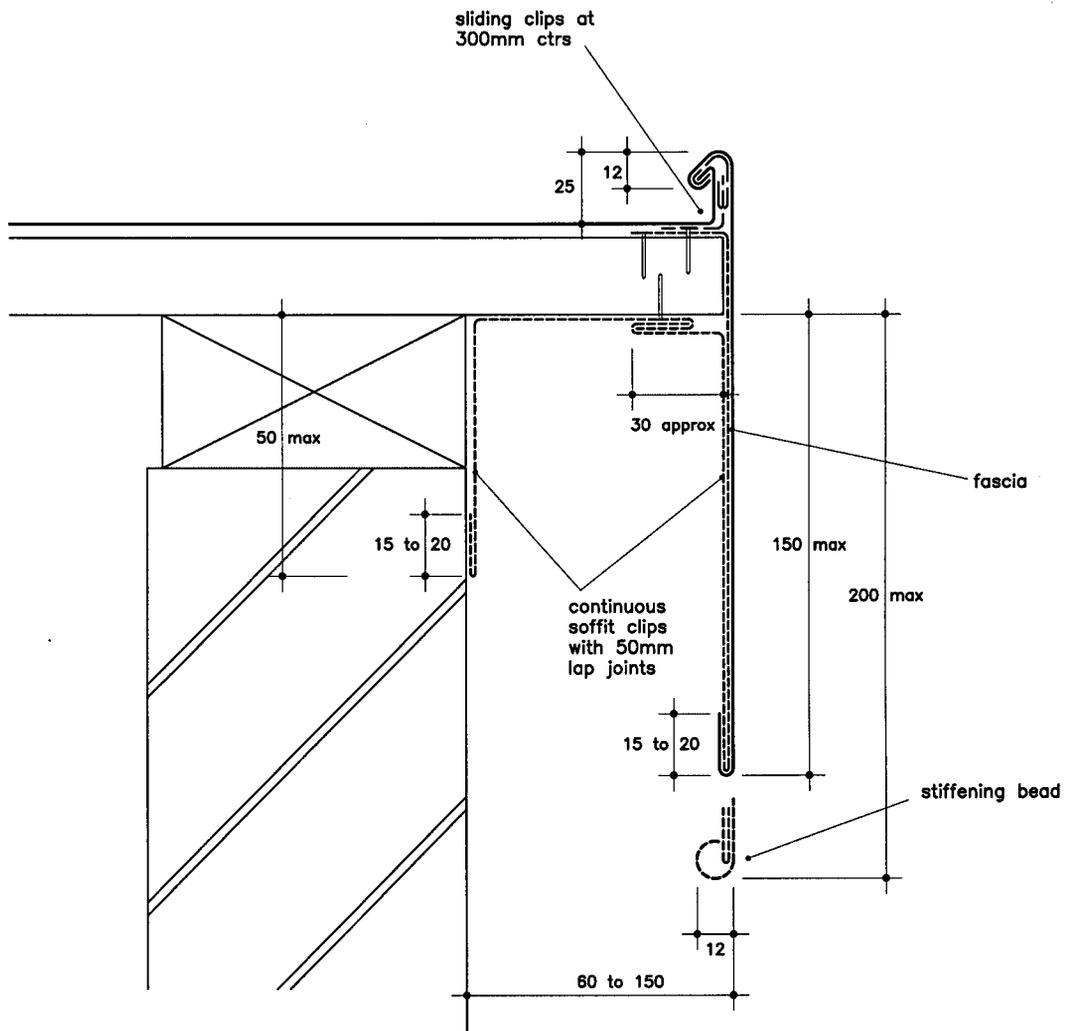
Stage 1

Nail continuous fixing strip at 100mm centres to substrate along the line of the verge. Along the same line nail sliding clips for the roofing sheet. Then loosely clip the roofing sheet in place.



Stage 2

Hook the bottom edge of the pre-formed fascia around the bottom edge of the continuous fixing strip. Complete the fixing at the top with a double-lock welt to the edge turn-up of the roofing sheet. The welt is loosely made to allow movement. Use cranked seaming pliers.



* A minimum overhang of 60mm is recommended to avoid staining of facade materials by water run-off.

Fig 25a
Standing seam verge over brickwork with copper fascia up to 250mm deep, maximum 150mm overhang

TRADITIONAL LONG STRIP

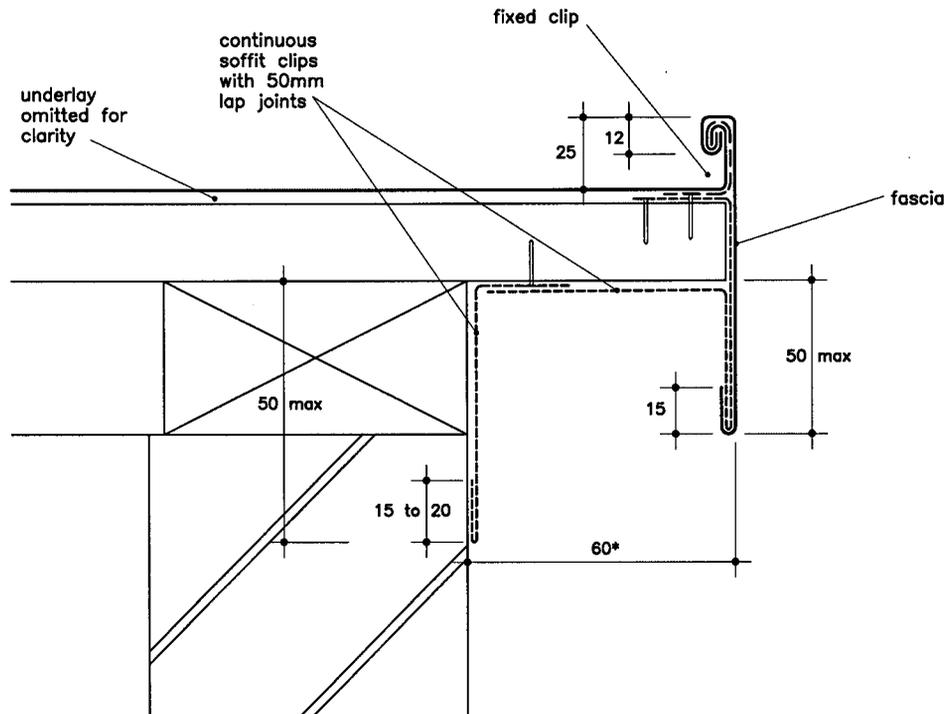
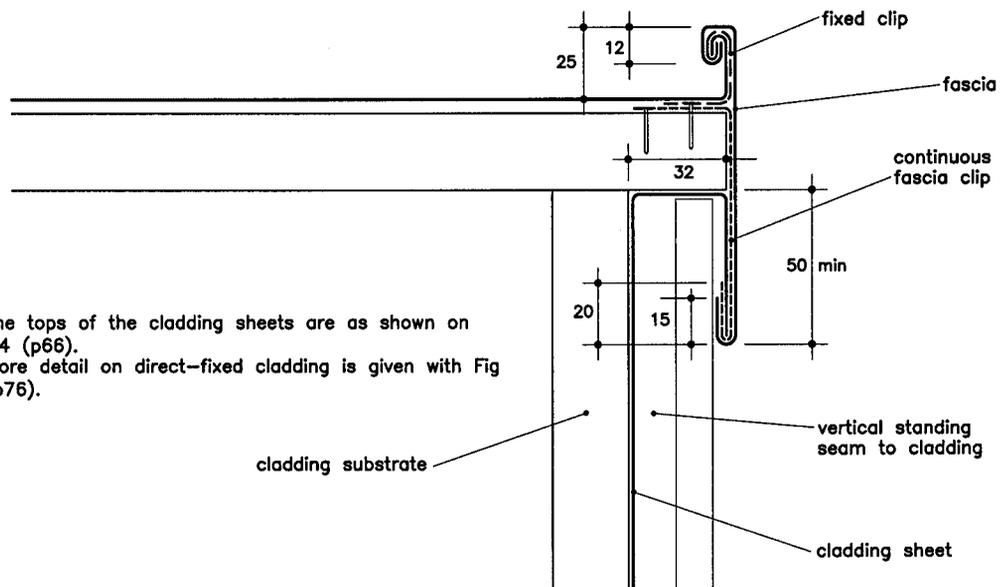


Fig 25b
Standing seam verge over brickwork with copper fascia up to 100mm deep, 60mm overhang

TRADITIONAL LONG STRIP



* The tops of the cladding sheets are as shown on Fig 24 (p66).
* More detail on direct-fixed cladding is given with Fig 29 (p76).

Fig 25c
Standing seam verge over direct-fixed cladding with copper fascia up to 200mm deep

TRADITIONAL LONG STRIP

Fig 26 ... at eaves with roof pitch up to 20degrees

This detail, together with Fig 26a, illustrates the essentials of forming an eaves detail in Long Strip roofing. And in Traditional roofing where either the Concave-form seam end (see Fig 4), the Chamfer-form seam end (see Fig 5) or the Square-form seam end (see Fig 6) is chosen. Only the Turned-down seam end (see Fig 3) allows the roofing sheets to be tightly welted down, thereby achieving weathertightness on its own. This weltting down allows no movement and so, of course, is only possible in Traditional roofing.

For roof pitches up to 20degrees, a 3mm to 5mm anti-capillarity recess is formed in the substrate to accommodate the eaves strip. The eaves strip should go up the roof slope 130mm minimum from the front edge of the substrate. The 200mm shown is a good dimension to work to and gives a measure of tolerance. Its top edge is held by weltting to clips at 300mm centres.

For roof pitches at and over 20degrees, a recess is not required for the eaves strip; nor is it weltted to clips along its top edge. It is simply nailed to the substrate at 100mm staggered centres.

Whatever the pitch the detail at the front edge is the same. The eaves strip is folded back to form a 'hook'. This engages with either individual clips at 300mm centres, or, as is often easier in practice, with a continuous fixing strip, nailed to the substrate at 100mm staggered centres. With some details it is possible to omit these fixings because there is some other well-fixed profile of copper available for the eaves strip to hook around (see Fig 29, p76).

A 10mm to 15mm weathercheck is formed in the eaves strip for exposed situations or for roof pitches below 15degrees.

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the eaves strip. To achieve this the roofing sheets are cut to project 40mm beyond the finished eaves strip. When folded under they engage the eaves strip by 20mm, ensuring that even in expansion they remain well retained.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished eaves strip, giving an engagement of 15mm approximately.

Lengths of eaves strip should not exceed 2m maximum. Joints in the run of the eaves strip are either 150mm lapped or, more usually and preferably, 50mm lapped and sealed. Note that joints in eaves strips must be positioned at least 150mm from standing seams, but a convenient rule is to make such joints mid-bay. Therefore, the setting out of the eaves strip needs to take the roofing bays into account.

Underlays generally are discussed in Copper for roofing (see p3). There are two broad categories: waterproof and non-waterproof. Waterproof underlays are laid to lap over the eaves strip. Non-waterproof underlays can be laid to butt up to the top edge of the eaves strip.

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed eaves strip and drop apron; half-hard.

Thickness: 0.6mm or 0.7mm

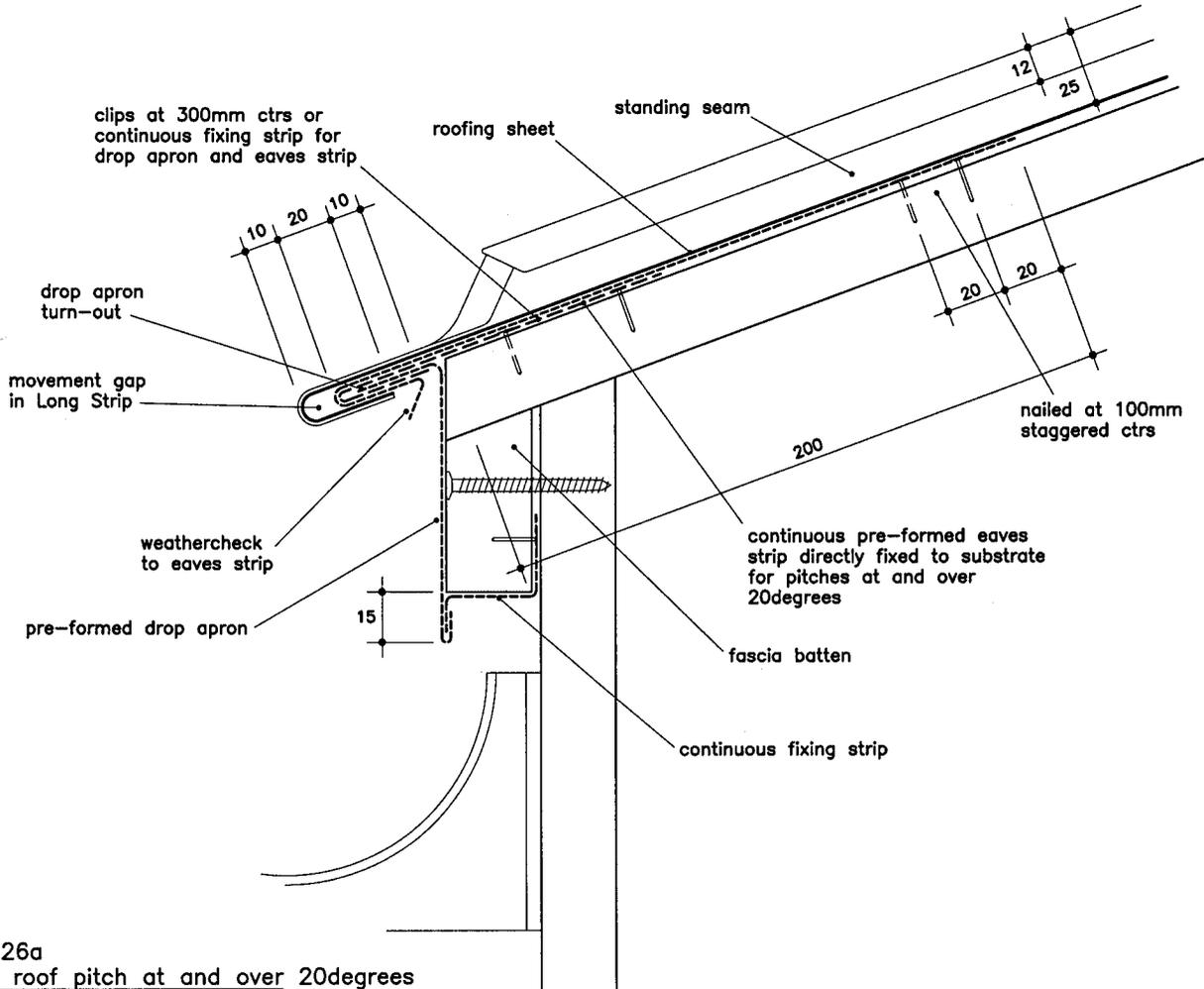


Fig 26a with roof pitch at and over 20degrees

TRADITIONAL LONG STRIP

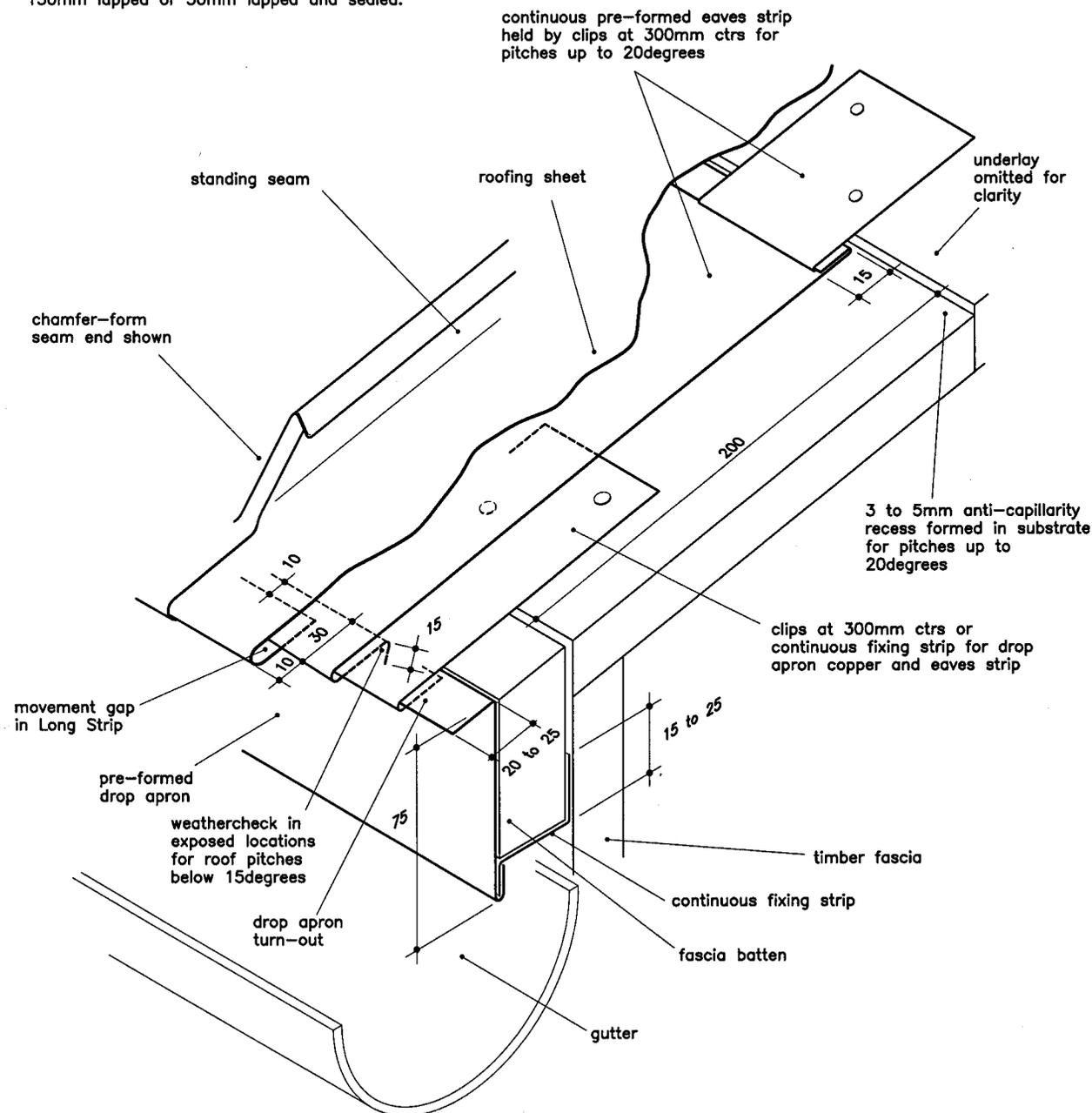
TRADITIONAL ✓ LONG STRIP ✓

Stage 3

Hook the front edge of the continuous pre-formed eaves strip around the turn-out of the drop apron. Fix the top edge of the eaves strip with clips at 300mm centres. Lengths of eaves strip should not exceed 2m maximum. Joints in the run of the eaves strip are either 150mm lapped or 50mm lapped and sealed.

Stage 4

Fix the roofing sheets in place, forming the chosen seam end as described in Figs 4 (p22), 5 (p28) and 6 (p30). Then fold the ends of the roofing sheets, now united, under the eaves strip. Eaves folders ('first and second turn') should be used.



Stage 2

Hook the bottom edge of the pre-formed drop apron around the fixing strip and retain its top edge with clips at 300mm centres. Joints in the run of both the fixing strip and the drop apron are 50mm lapped joints.

Stage 1

Nail the continuous fixing strip, for holding the bottom edge of the drop apron, to the back of the fascia batten at 100mm centres. Screw the fascia batten in place making sure that its top surface is flush with the main substrate. Alternatively it can be designed to fit under the main substrate carried forward, as shown on Fig 26a opposite.

Fig 27 ... at eaves with alternative fixing plate for eaves strip

The fixing plates are designed to engage both the 'hook' of the eaves strip and its downstand. They are used to give extra rigidity to the downstand, if this is required because of exposure. However, because it is quicker to install, the continuous fixing strip is a more common detail, in spite of the fact that it uses more copper.

More detail on eaves strips and their installation is given in Figs 26 and 26a (p72).

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the eaves strip. When folded under they engage the eaves strip by 20mm, ensuring that even in expansion they remain well retained.

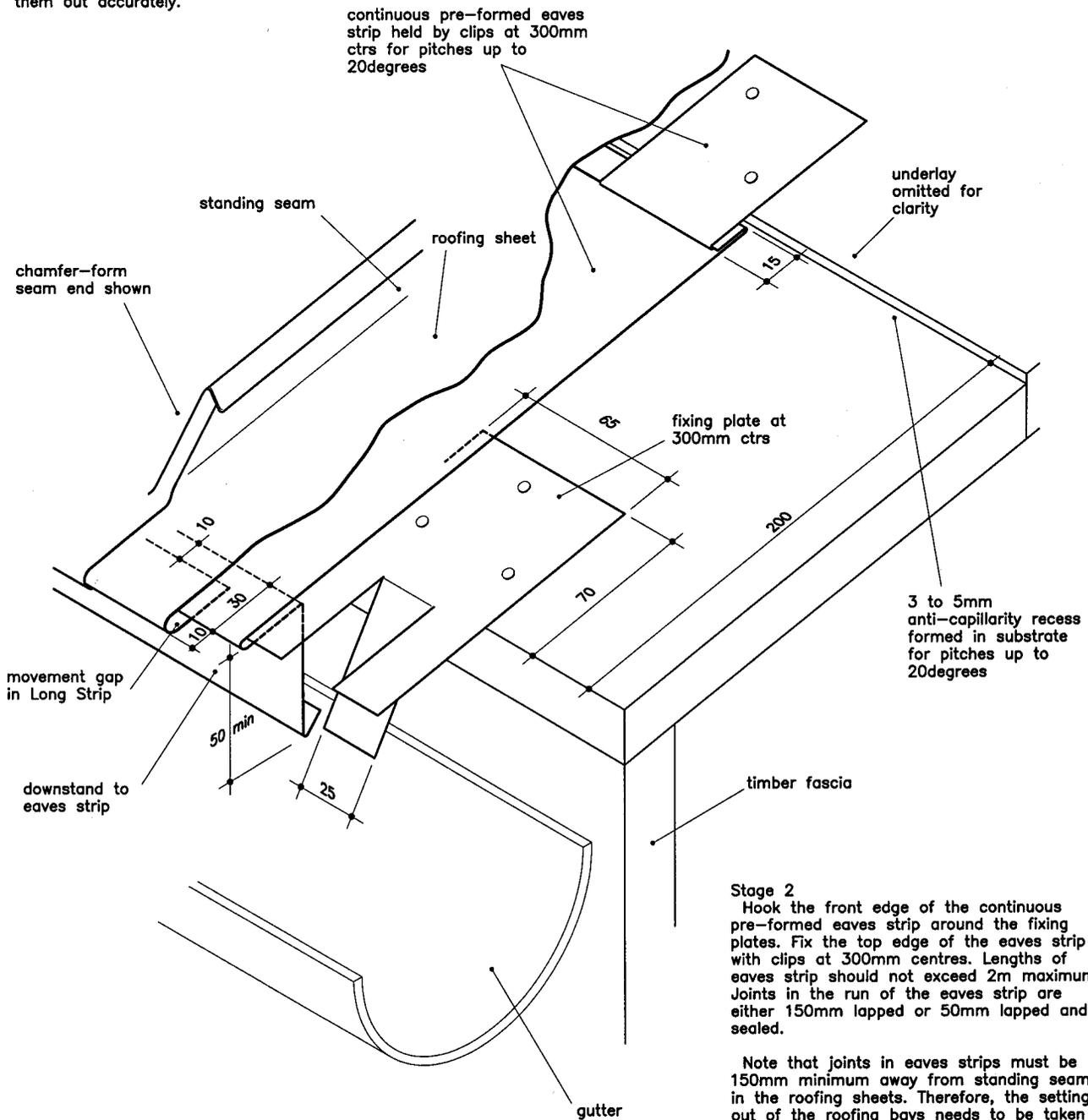
In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished eaves strip, giving an engagement of 15mm approximately.

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed eaves strip with downstand; half-hard.
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

Stage 1
Nail fixing plates in position at 300mm centres along the eaves line. A string line will help to set them out accurately.

Stage 3
Fix the roofing sheets in place, forming the chosen seam end as described in Figs 4 (p22), 5 (p28) and 6 (p30). Then fold the ends of the roofing sheets, now united, under the eaves strip. Eaves folders ('first and second turn') should be used.



Stage 2
Hook the front edge of the continuous pre-formed eaves strip around the fixing plates. Fix the top edge of the eaves strip with clips at 300mm centres. Lengths of eaves strip should not exceed 2m maximum. Joints in the run of the eaves strip are either 150mm lapped or 50mm lapped and sealed.

Note that joints in eaves strips must be 150mm minimum away from standing seams in the roofing sheets. Therefore, the setting out of the roofing bays needs to be taken into account at this stage.

Fig 28 ... at eaves with roof pitch at and over 20degrees

If a copper clad fascia is required (see Fig 4a) it must be completed before the gutter brackets are fixed. The cladding is usually held with a continuous fixing strip along its bottom edge, and nailed directly to the substrate along its top edge.

With different brackets it is possible to fix the copper gutter to the fascia board rather than the substrate.

More detail on eaves strips and their installation is given in Figs 26 and 26a (p72).

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the eaves strip. When folded under they engage the eaves strip by 20mm, ensuring that even in expansion they remain well retained.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished eaves strip, giving an engagement of 15mm approximately.

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed eaves strip with downstand; half-hard.

Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

Stage 3

Hook the front edge of the continuous pre-formed eaves strip around the fixing strip. Nail the top edge of the eaves strip to the substrate, at 100mm staggered centres. Lengths of eaves strip should not exceed 2m maximum. Joints in the run of the eaves strip are either 150mm lapped or 50mm lapped and sealed.

Stage 4

Fix the roofing sheets in place, forming the chosen seam end as described in Figs 4 (p22), 5 (p28) and 6 (p30). Then fold the ends of the roofing sheets, now united, under the eaves strip. Eaves folders ('first and second turn') should be used.

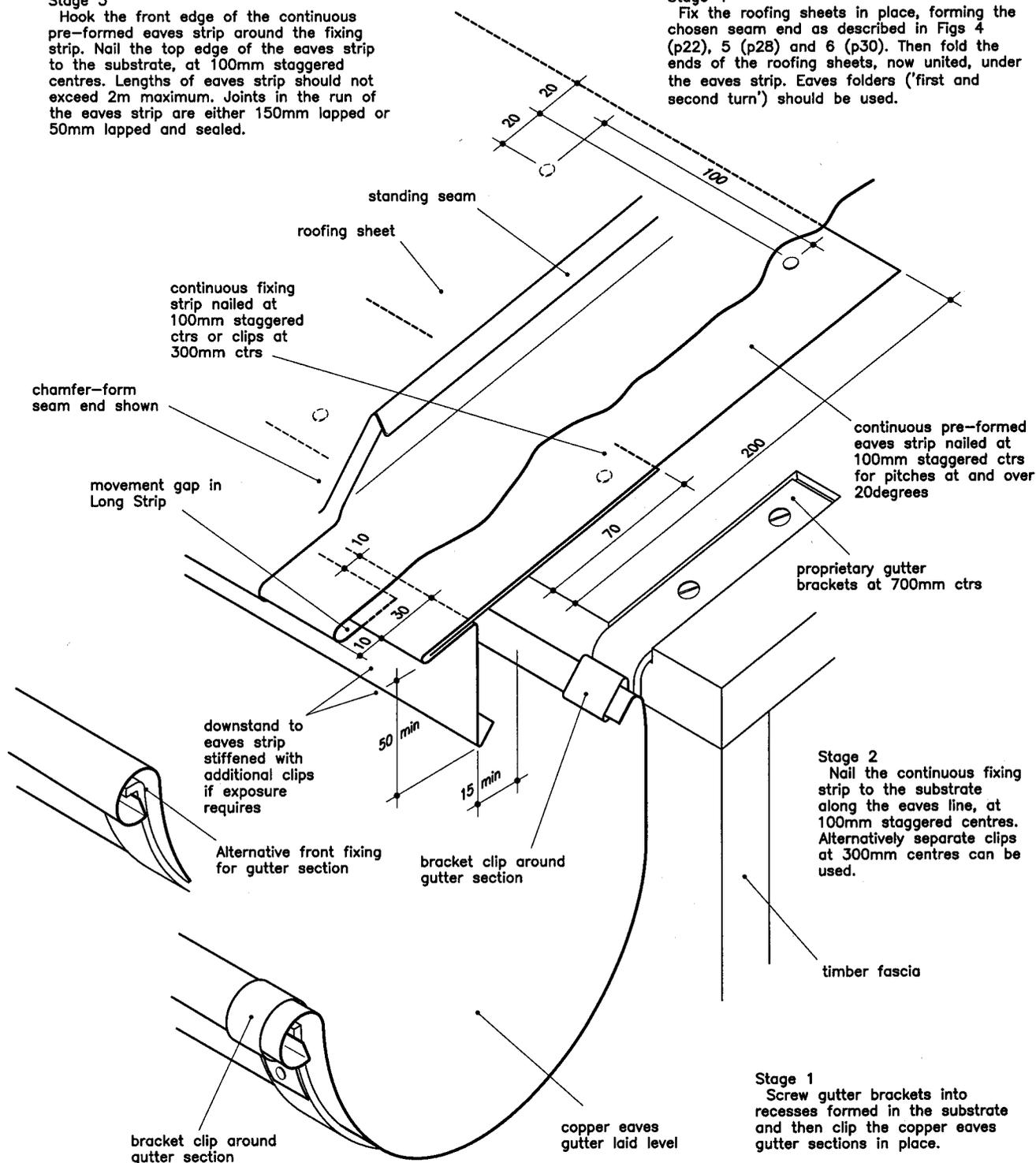


Fig 29 ... at eaves above direct-fixed cladding

The detail shows an eaves strip suitable for roof pitches at and over 20degrees. For roof pitches up to 20degrees and more detail on eaves strips see Figs 26 and 26a (p72)

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the eaves strip. When folded under they engage the eaves strip by 20mm, ensuring that even in expansion they remain well retained.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished eaves strip, giving an engagement of 15mm approximately.

Cladding sheets are most commonly produced as roll-formed profiled trays (see Fig 2), using half-hard temper copper. This is the most efficient method of forming standing seams. It also gives a very consistent and precise appearance to the seam. As seaming machines can work up to the vertical, both speed and quality can be achieved.

The 'angle standing seam', which is simply the seam without the final turn in the welt being made, is often used in cladding because there tends to be less localised distortion or quilting effect to the copper sheet.

The acceptable width for cladding bays is determined in the same way as for roofing bays, by taking into account exposure and roof height (see Tables M and N, p12).

In Long Strip cladding the spacing of horizontal joints will range from 3m to 6m maximum, the latter being determined more by the practicalities of handling rather than any other consideration. Joints can usually be avoided when columns or other similar features are to be clad.

In Traditional cladding the maximum spacing of horizontal joints is 3 metres. Where the vertical joints are double-lock standing seams, the horizontal joints must be staggered 50mm minimum and are most likely to be single-lock welts.

For other details featuring cladding see Figs 23 (p65), 24 (p66) and 25c (p71).

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed eaves strip; half-hard. Cladding; quarter- or half-hard. Thickness: 0.6mm or 0.7mm

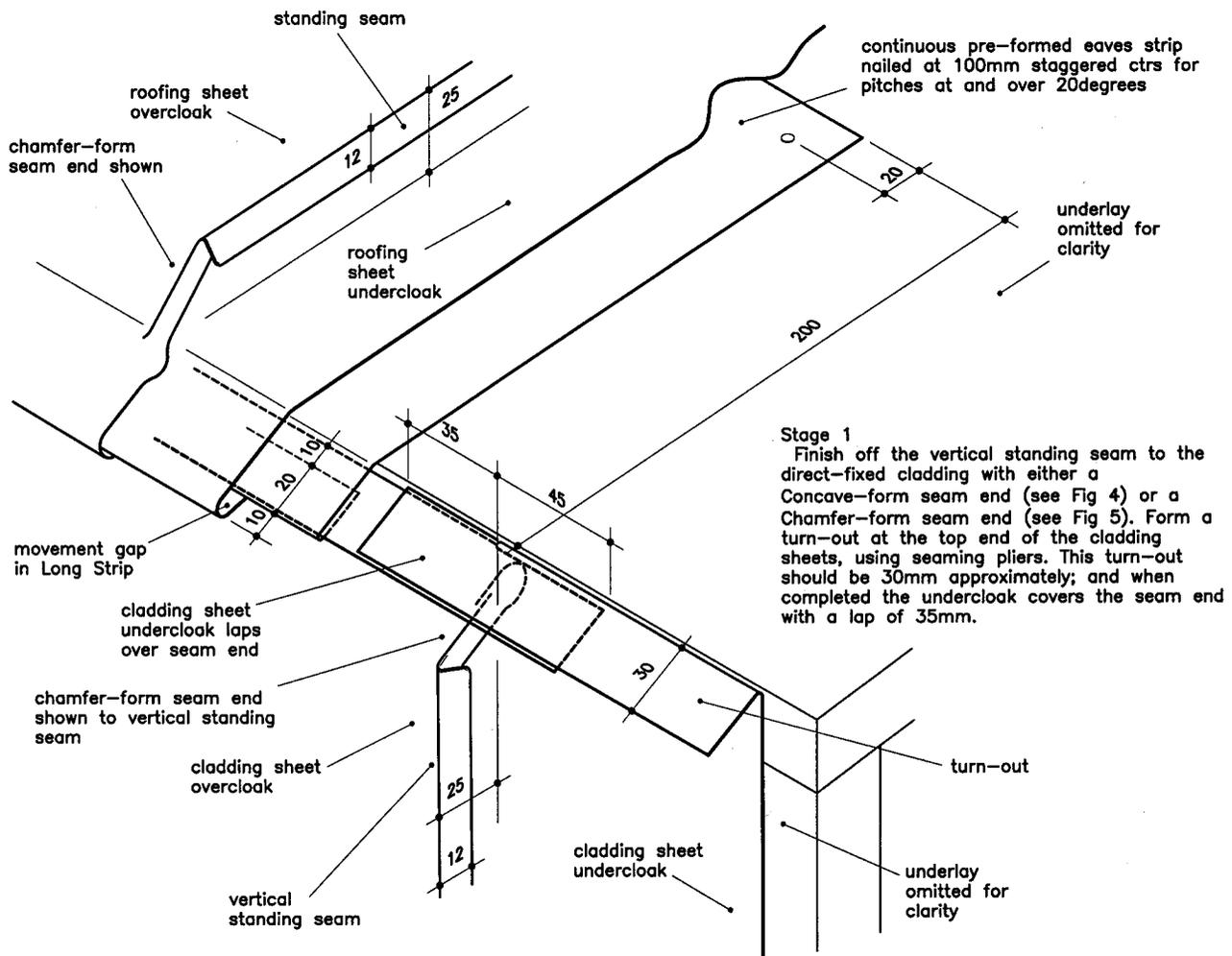
TRADITIONAL ✓ LONG STRIP ✓

Stage 2

Hook the front edge of the continuous pre-formed eaves strip around the turn-out. Nail the top edge of the eaves strip to the substrate, at 100mm staggered centres. Lengths of eaves strip should not exceed 2m maximum. Joints in the run of the eaves strip are either 150mm lapped or 50mm lapped and sealed, preferably the latter.

Stage 3

Fix the roofing sheets in place, forming the chosen seam end as described in Figs 4 (p22), 5(p28) and Fig 6 (p30). Then fold the ends of the roofing sheets, now united, under the eaves strip. Eaves folders ('first and second turn') should be used.



Stage 1
Finish off the vertical standing seam to the direct-fixed cladding with either a Concave-form seam end (see Fig 4) or a Chamfer-form seam end (see Fig 5). Form a turn-out at the top end of the cladding sheets, using seaming pliers. This turn-out should be 30mm approximately; and when completed the undercloak covers the seam end with a lap of 35mm.

Stage 2

Hook the front edge of the continuous pre-formed lining plate around the turn-out of the gutter lining. As with the clips, the lining plate should not hold the gutter tightly. Fix the top edge of the lining plate with clips at 300mm centres. Lengths of lining plate should not exceed 2m maximum. Joints in the run of the lining plate are either 150mm lapped or 50mm lapped and sealed, preferably the latter.

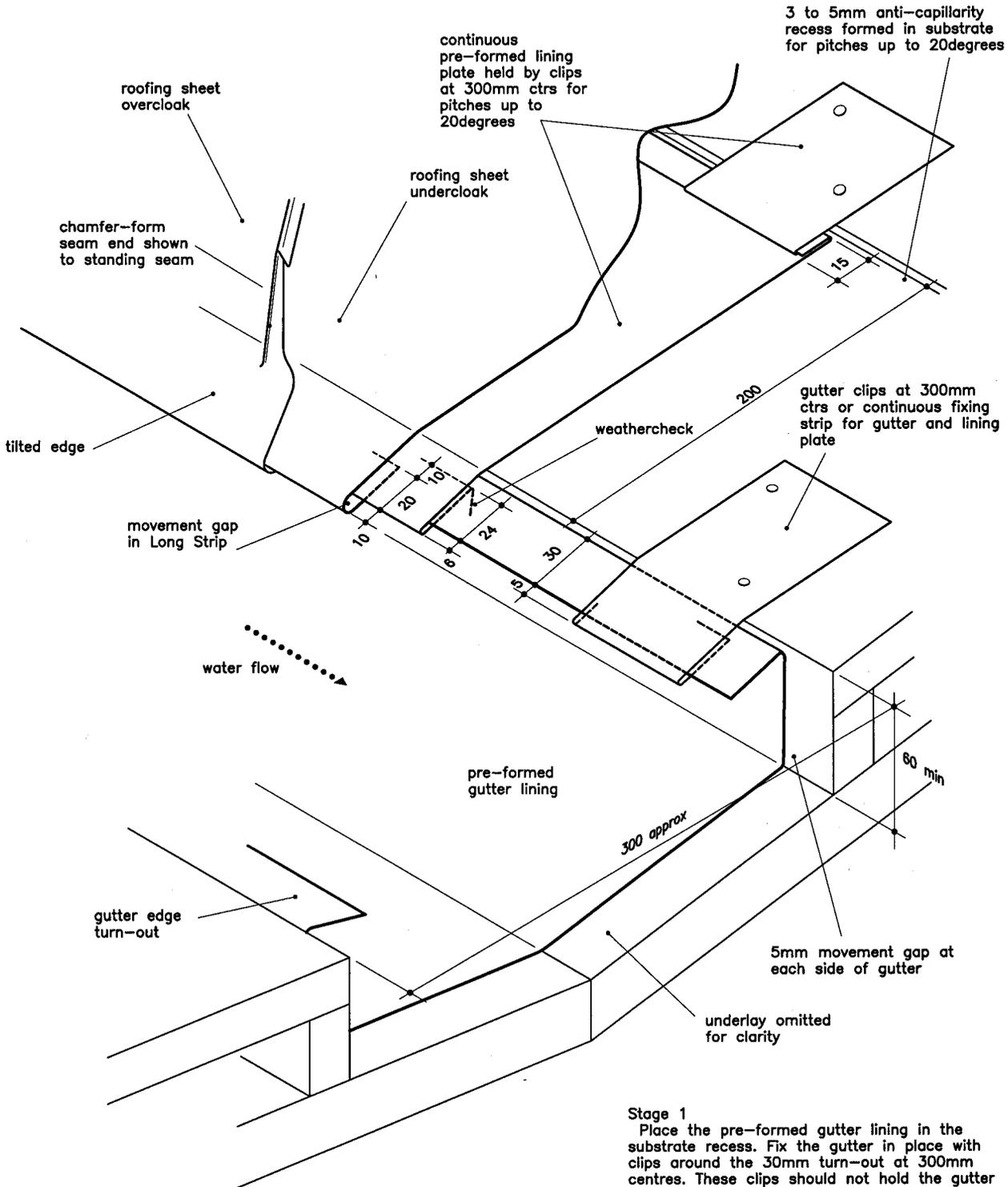
Note that joints in lining plates must be 150mm minimum away from standing seams in the roofing sheets. Therefore, the setting out of the roofing bays needs to be taken into account at this stage.

TRADITIONAL LONG STRIP

Stage 3

Fix the roofing sheets in place, forming the chosen seam end as described in Figs 4 (p22), 5 (p28) and 6 (p30). Then fold the ends of the roofing sheets, now united, under the lining plate. Cranked seaming pliers should be used.

With a recessed gutter it makes no difference which way the standing seam undercloaks face.



Stage 1

Place the pre-formed gutter lining in the substrate recess. Fix the gutter in place with clips around the 30mm turn-out at 300mm centres. These clips should not hold the gutter tightly, so that it can move in response to changes in temperature. Also the width of the gutter lining is made 10mm less than the width of the recess, allowing free movement.

Fig 30 ... at recessed pitched valley gutter

This detail, Fig 30 (p78), together with Figs 30a and 30b, illustrates the essentials of forming a recessed pitched valley gutter in Long Strip roofing. And in Traditional roofing where either the Concave-form seam end (see Fig 4), the Chamfer-form seam end (see Fig 5) or the Square-form seam end (see Fig 6) is chosen.

Only the Turned-down seam end (see Fig 3) allows the roofing sheets to be tightly welted down, thereby achieving weathertightness on its own. This welted down allows no movement and so, of course, is only possible in Traditional roofing.

In Traditional roofing when the Turned-down seam end (see Fig 3) is being used, the tight welted around the gutter lining prevents it from moving. Therefore, sections of gutter lining should not exceed 3 metres. These are joined with a drip-step, a hand-formed double-lock cross welt or a single-lock cross welt, dependent on the gutter pitch (see Tables P and T, p13). The roofing sheets are clipped along the top edge of the gutter recess, with clips 150mm approximately above each standing seam. Because the roofing and lining are tightly welted, the depth of the gutter recess can be reduced to 32mm.

In Long Strip roofing, or in Traditional roofing where the seam ends referred to above are used, the gutter lining is free to move. However, some movement joints are still needed, so that no section of gutter exceeds 10 metres in length.

The most common way of forming a movement joint is to use a vulcanised neoprene strip such as T-Pren. These have been in use for 25 years and their record so far has been trouble-free. The neoprene strip should be protected from ultra-violet by a copper cover-piece which is welted over the gutter turn-out and held in place by the lining plate. This also improves its appearance. In hot weather the neoprene tends to distort, creating an interruption to the water flow; so to avoid the risks with debris building up, the minimum pitch of the valley gutter should be 6degrees and the depth of the gutter recess increased to 150mm.

The vulcanised neoprene strip is factory bonded between two strips of copper. On site these are soft-soldered to the gutter lining sections, sometimes with the addition of copper rivets. The working temperature of soft-soldering is 400degC. If the underlay is susceptible to damage at this temperature, it must be protected. Brazing or hard-soldering is also possible but, as the working temperature is 750degC, it might not be allowed on certain buildings if hot working is restricted.

Other movement joints are possible (see Tables P and T, p13).

Apart from movement joints, gutter linings should be laid in one piece. Individual sections are joined by brazing, or soft-soldering with the joint strengthened by copper rivets.

For roof pitches up to 20degrees, a 3mm to 5mm anti-capillarity recess is formed in the substrate to accommodate the lining plate. The lining plate should go up the roof slope 130mm minimum from the edge of the recess. The 200mm shown is a good dimension to work to and gives a measure of tolerance. Its top edge is held by welted to clips at 300mm centres.

For roof pitches at and over 20degrees, a recess is not required for the lining plate; nor is it welted to clips along its top edge. It is simply nailed to the substrate at 100mm staggered centres (see Fig 30b).

Whatever the pitch the detail at the front edge is the same. The lining plate is folded under to form a 'hook'. This engages with either the individual clips at 300mm centres retaining the gutter turn-out; or, as is often easier in practice, with a continuous fixing strip, nailed to the substrate at 100mm staggered centres.

A 10mm to 15mm weathercheck is formed in the lining plate against wind driven rain or rainwater splashing up in storm conditions.

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the lining plate. To achieve this the roofing sheets are cut to project 40mm beyond the finished lining plate. When folded under they engage the lining plate by 20mm, ensuring that even in expansion they remain well retained.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished lining plate, giving an engagement of 15mm approximately.

Lengths of lining plate should not exceed 2m maximum. Joints in the run of the lining plate are either 150mm lapped or, more usually and preferably, 50mm lapped and sealed. Note that joints in lining plates must be positioned at least 150mm from standing seams, but a convenient rule is to make such joints mid-bay. Therefore, the setting out of the lining plate needs to take the roofing bays into account.

With a recessed gutter it makes no difference which way the standing seam undercloaks face, but they usually face down the gutter. This is because the gutter is laid from the bottom up.

Underlays generally are discussed in Copper for Roofing (see p3). There are two broad categories: waterproof and non-waterproof. Waterproof underlays are laid to lap over the lining plate. Non-waterproof underlays are laid to butt up to the top edge of the lining plate. Where the valley gutter discharges into a parapet gutter, waterproof underlays are laid to drain over in the normal way.

A waterproof underlay is recommended under the gutter lining. It is carried up the sides of the recess and onto the substrate, where it is held in position by the gutter clips.

A recessed gutter with batten roll is shown in Fig 52 (p118).

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed gutter lining and lining plate; half-hard.

Thickness: 0.6mm or 0.7mm

This detail can be used where the pitches of the roofs discharging into the gutter are at or over 13.5degrees. This is based on maintaining a fall over the fillet of 6degrees, the acceptable minimum pitch for unsealed double-lock standing seams; and on the width of the fillet being 250mm. This gives a minimum pitch to the valley gutter of 9.5degrees. Note the cut face of the fillet faces upwards, so that the angle between the gutter sole and the edge upstand is 90degrees.

The tilting fillets form what is, in effect, a recessed gutter. Recessed gutters are dealt with in detail in Fig 30 (pp77 and 78). Note that the lining plate detail will change for pitches up to 20degrees, as shown in Figs 30 and 30a.

The Concave-form seam end (see Fig 4), the Chamfer-form seam end (see Fig 5) or the Square-form seam end (see Fig 6) can all be used with this detail; and in both Long Strip and Traditional roofing.

The Turned-down seam end (see Fig 3) is also possible, but only in Traditional roofing.

Apart from movement joints (see Fig 30 and Tables P and T, p13), gutter linings should be laid in one piece. Individual sections are joined by brazing, or soft-soldering with the joint strengthened by copper rivets. Alternatively the gutter lining is formed from one length of copper.

In Long Strip roofing, a 10mm movement gap is allowed when the roofing sheets are turned under the lining plate. To achieve this the roofing sheets are cut to project 40mm beyond the finished lining plate. When folded under they engage the lining plate by 20mm, ensuring that even in expansion they remain well retained. It is important to check that the fillet is wide enough to allow the standing seam to move freely over the change of pitch angle.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the finished lining plate, giving an engagement of 15mm approximately.

A waterproof underlay is recommended under the gutter lining. It is carried up the sides of the 'recess' and over the fillet, where it is held in position by the gutter clips.

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed gutter lining and lining plate; half-hard.
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

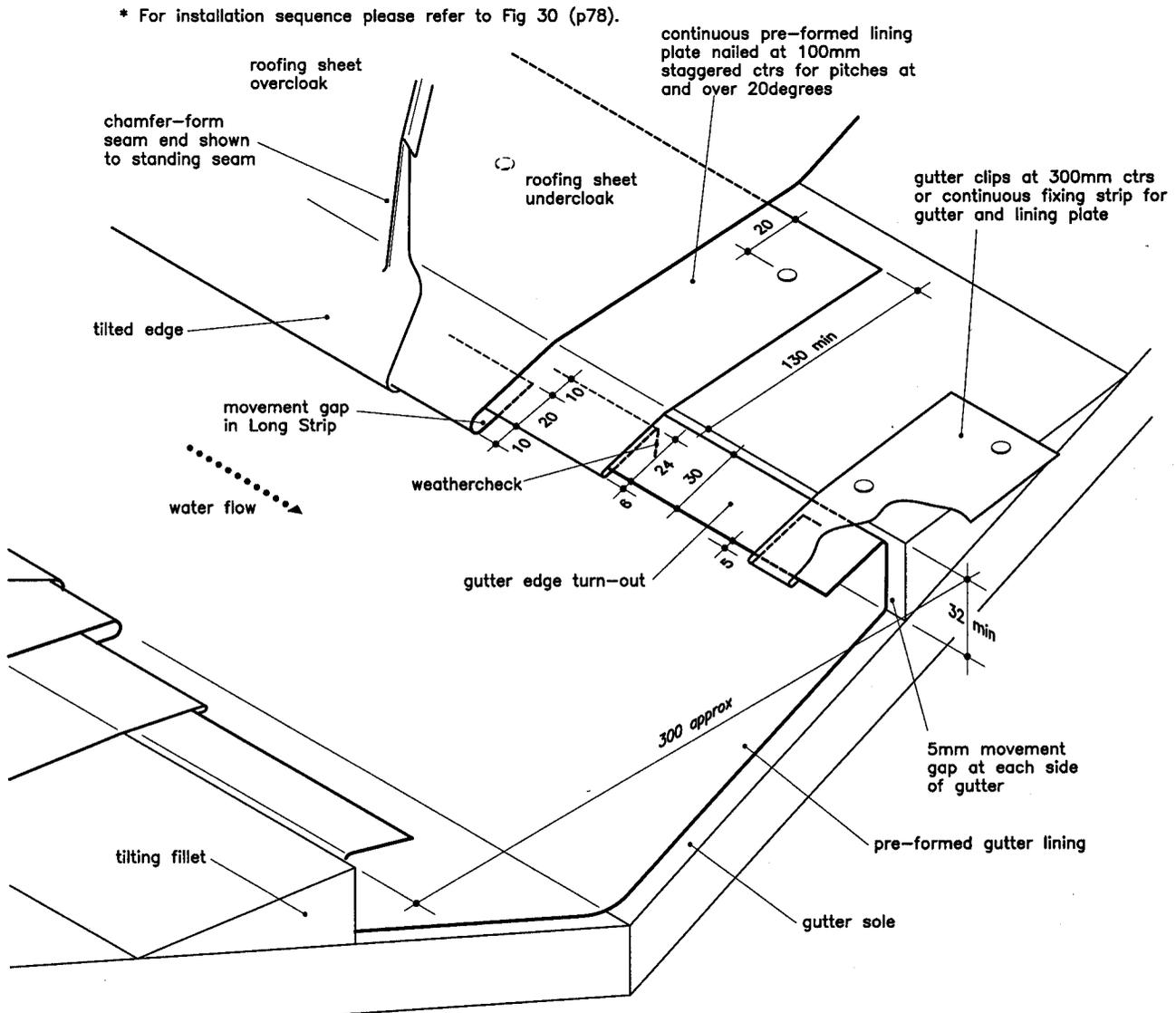


Fig 32 ... at pitched valley with standing seam edges

This type of gutter is used to join subsidiary roof features to the main roof. Its most usual application is with pitched-roof dormers. For such small gutters a minimum width of 200mm is possible, but the wider the gutter the easier it is to manipulate the tools. For longer gutters a minimum width of 300mm is recommended for ease of laying, and future maintenance access.

Note that the water from the adjacent roofing sheets does not drain into the gutter itself but is stopped by the standing seams. It drains over the seam ends and so it is essential that these are turned over in the direction of the water flow. Also that the welts of the longitudinal seams face into the gutter. Where the gutter pitch is less than 20degrees, the seam ends should be sealed for 200mm up the standing seam from the start of the turn-down.

Where, exceptionally, this detail is needed for longer gutters, sections of gutter lining should not exceed 3 metres. They are joined using a hand-formed double-lock cross welt (see Figs 14 and 34), or a single-lock cross welt, dependent on the gutter pitch (see Tables P and T, p13).

Temper: Roofing sheet with turned-down seam end; soft, preferably. Gutter lining; soft. Dormer roofs etc, if applicable; soft.

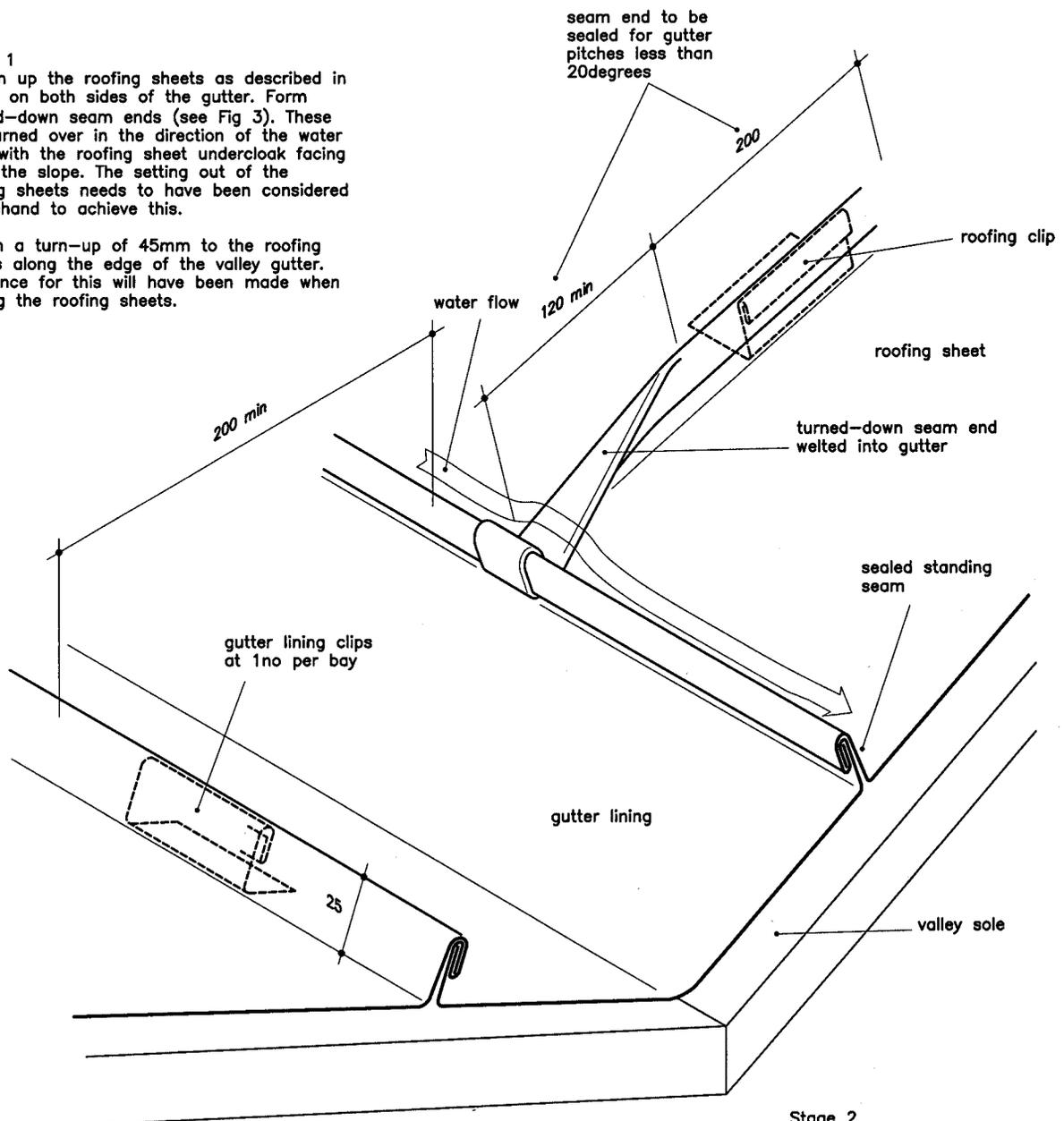
Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP

Stage 1

Seam up the roofing sheets as described in Fig 1, on both sides of the gutter. Form Turned-down seam ends (see Fig 3). These are turned over in the direction of the water flow, with the roofing sheet undercloak facing down the slope. The setting out of the roofing sheets needs to have been considered beforehand to achieve this.

Form a turn-up of 45mm to the roofing sheets along the edge of the valley gutter. Allowance for this will have been made when cutting the roofing sheets.



Stage 3

Place the gutter lining in position between the 45mm turn-ups of the roofing sheets. Welt the roofing sheets to the gutter lining, forming a sealed double-lock standing seam.

Stage 2

Measure and cut the valley gutter lining. This should have a width of 200mm minimum and have turn-ups along each edge of 35mm. Apply a sealing strip, running along the top of the outside face of the turn-ups.

Nail clips for gutter standing seam to substrate at 1no per bay.

Fig 33 ... at pitched valley with lap-lock to gutter lining

This detail can be used where the pitches of the roofs discharging into the gutter are at or over 10degrees. This gives a minimum pitch to the valley gutter of 7degrees.

In Traditional roofing no movement gap is required. The roofing sheets are cut to project 20mm beyond the fixing strip, giving an engagement of 15mm approximately.

In both Long Strip and Traditional roofing the gutter lining is free to move. However, some movement joints are still needed, so that no section of gutter exceeds 10 metres in length (see Tables P and T, p13). The most common way of forming such a joint is to use a vulcanised neoprene strip such as T-Pren. This type of movement joint is described in more detail in Fig 30 (p77). The lap-lock cross welt is also frequently used.

Apart from movement joints, gutter linings should be laid in one piece. Individual sections are joined by brazing, or soft-soldering with the joint strengthened by copper rivets. Alternatively the gutter lining is formed from one length of copper.

A waterproof underlay is recommended under the gutter lining. It should be carried up the roof for 450mm on each side of the centreline, to meet the main roofing sheet underlay.

Temper: Roofing sheet with chamfer-form seam end; half-hard preferably. Pre-formed gutter lining etc; half-hard. Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✓

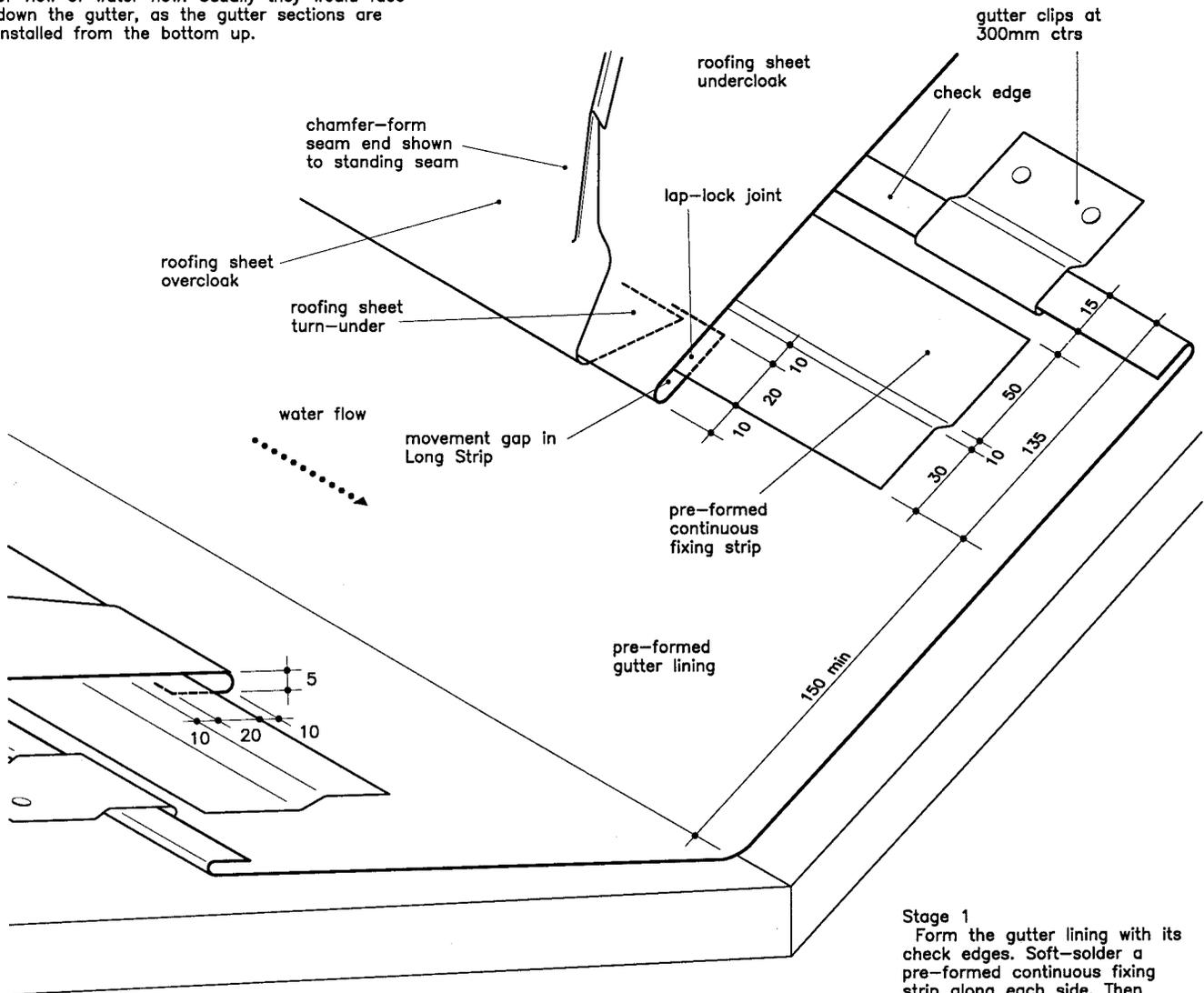
Stage 3

Hook the roofing sheets in position to engage with the continuous fixing strip. Seam up the roofing sheets as described in Fig 1 or Fig 2, on both sides of the gutter, and complete with the appropriate seam end.

It makes no difference which way the standing seam undercloaks face from the point of view of water flow. Usually they would face down the gutter, as the gutter sections are installed from the bottom up.

Stage 2

Mark out the roofing sheets to the line of the gutter and for forming the chosen seam end as described in Figs 4 (p22), 5 (p28) and 6 (p30). Cut and cut away accordingly. Form the 30mm turn-under at the end of the roofing sheets, along the line of the gutter.



Stage 1

Form the gutter lining with its check edges. Soft-solder a pre-formed continuous fixing strip along each side. Then position the gutter lining in the valley and clip it to the substrate. These clips should not hold the gutter tightly, so that it can move in response to changes in temperature.

Fig 34 ... with pitched valley single-lock welted to roofing sheets

This detail can only be used in Traditional roofing. In Long Strip roofing the lap-lock detail shown in Fig 33 (see opposite) would be used.

It is used where the pitches of the roofs discharging into the gutter are at or over 25degrees. This gives a minimum pitch to the valley gutter of 18.25degrees.

The roofing sheets are finished with a variation of the Concave-form seam end (see Fig 4) or the Turned-down seam end (see Fig 3).

If joints in the gutter are made using double-lock cross welts, they need to be at 3m maximum centres. The cross welts are clipped and longitudinal movement in the gutter is restricted. The clips along the edge of the gutter lining can be made to hold it tightly. The cross welts must be sealed with gutter pitches up to 20degrees.

However, ideally, gutter linings should be laid in one piece. Individual sections are joined by brazing, or soft-soldering with the joint strengthened by copper rivets. Alternatively the gutter lining is formed from one length of copper. Movement joints are needed, so that no section of gutter exceeds 10 metres in length (see Tables P and T, p13).

The most common way of forming such a joint is to use a vulcanised neoprene strip such as T-Pren. This type of movement joint is described in more detail in Fig 30 (p77). The lap-lock cross welt is also frequently used. It is important that the clips along the edge of the gutter should not hold it tightly, so that it can move in response to changes in temperature.

A waterproof underlay is recommended under the gutter lining. It should be carried up the roof for 450mm on each side of the centreline, to meet the main roofing sheet underlay.

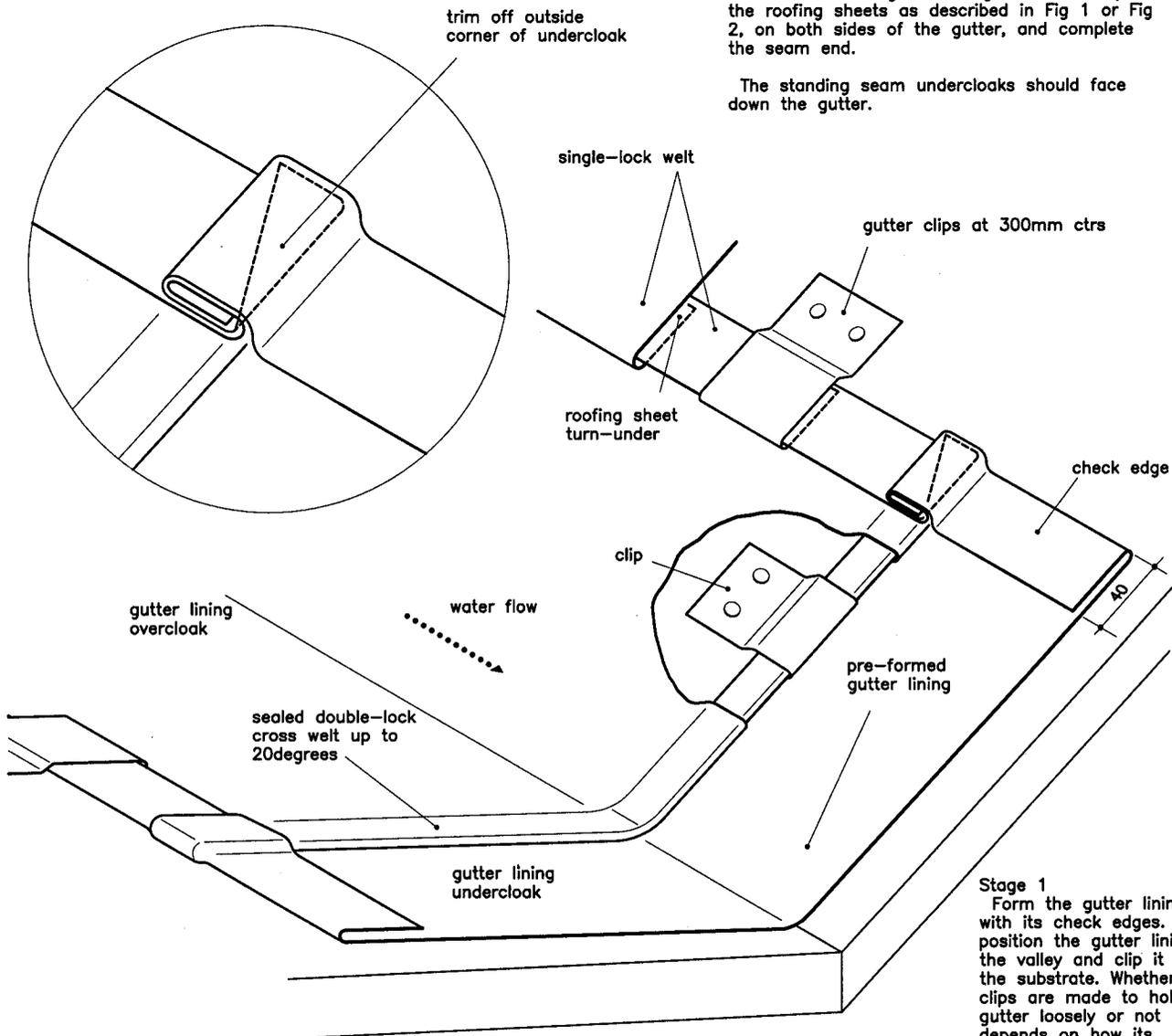
Temper: Roofing sheet and gutter lining; soft or quarter-hard preferably, but half-hard is also possible.
Thickness: 0.6mm or 0.7mm

TRADITIONAL ✓ LONG STRIP ✗

Stage 2
Mark out the roofing sheets to the line of the gutter for forming the chosen seam end. Cut and cut away accordingly. Form a 30mm turn-under to the end of the roofing sheets, along the line of the gutter.

Stage 3
Hook the roofing sheets in position to engage with the check edge of the gutter. Seam up the roofing sheets as described in Fig 1 or Fig 2, on both sides of the gutter, and complete the seam end.

The standing seam undercloaks should face down the gutter.



Stage 1
Form the gutter lining with its check edges. Then position the gutter lining in the valley and clip it to the substrate. Whether the clips are made to hold the gutter loosely or not depends on how its sections are to be joined (see Notes above).

Fig 35 Ventilation hood

This detail will only be required on roofs which need ventilating to avoid the risk of condensation; and in particular where some element of construction obstructs the free flow of air. This most commonly occurs at hips, pitched valley gutters and dormers. Ridges and abutments can quite easily be designed to accommodate more continuous ventilation slots, see Figs 13 (p49), 20 (p61) and 23 (p65).

Perforated copper insect mesh is available as a 40% perforated sheet. Copper or brass mesh is also available.

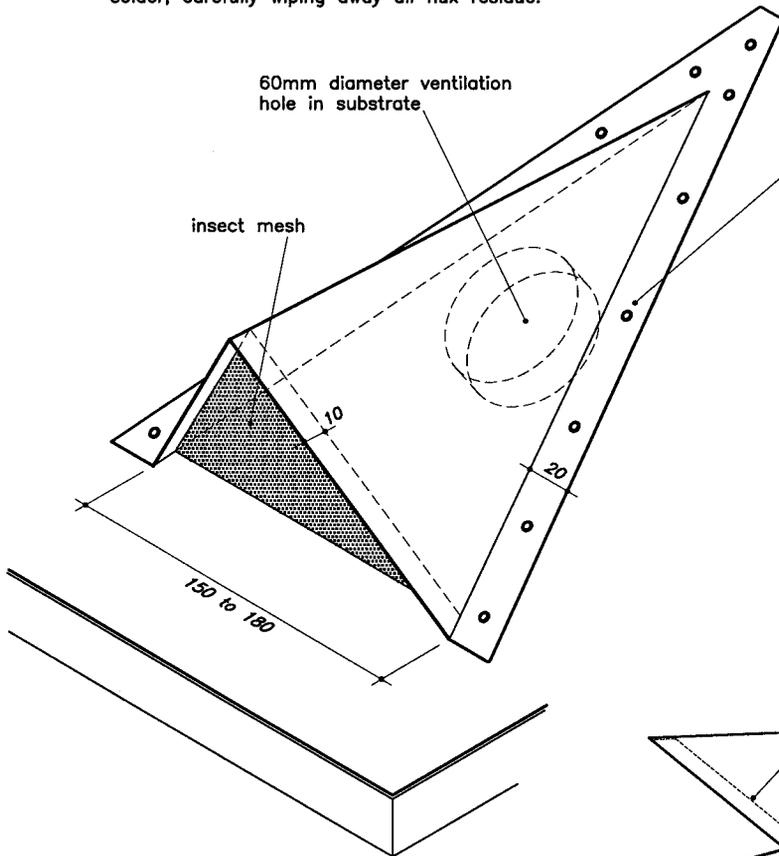
The ventilation hood is applicable to both Double-lock standing seam and Batten roll roofs.

Temper: quarter- or half-hard
Thickness: 0.6mm or 0.7mm

TRADITIONAL LONG STRIP

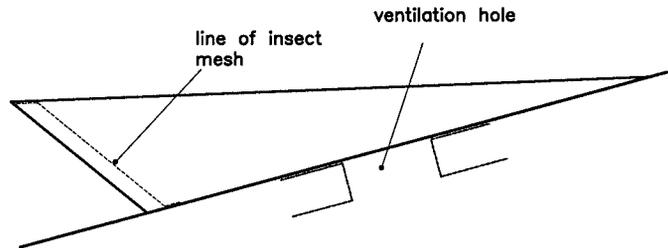
Stage 2

Fix the ventilation hood to the roofing sheet with copper rivets at 50mm centres. Alternatively use soft solder, carefully wiping away all flux residue.

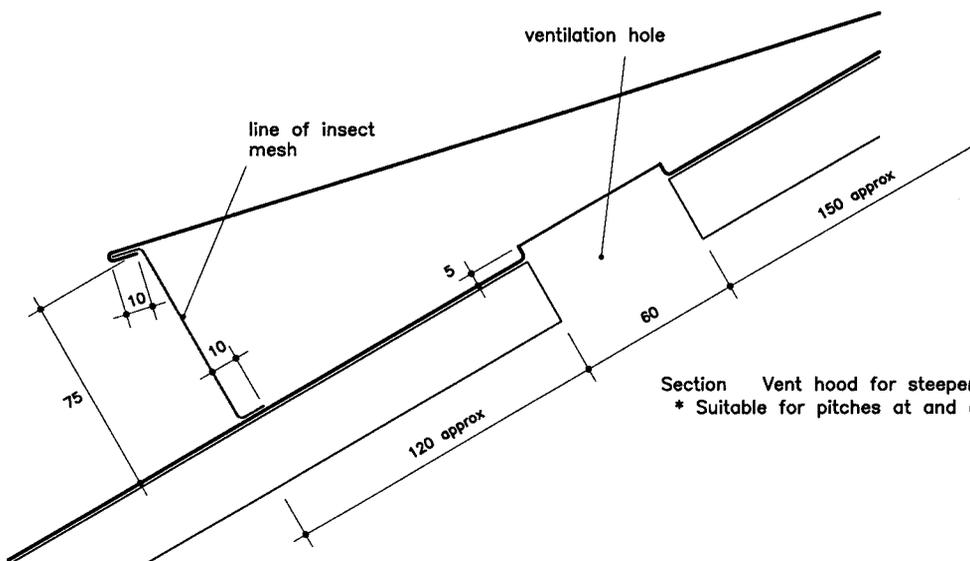


Stage 1

The hole, about 60mm in diameter, will already have been made through the substrate. After laying the roofing sheet, cut a circular hole through the copper with a diameter 10mm less than the hole through the substrate. Use curved snips. With a mallet, work the edge up to form a 5mm high lip.

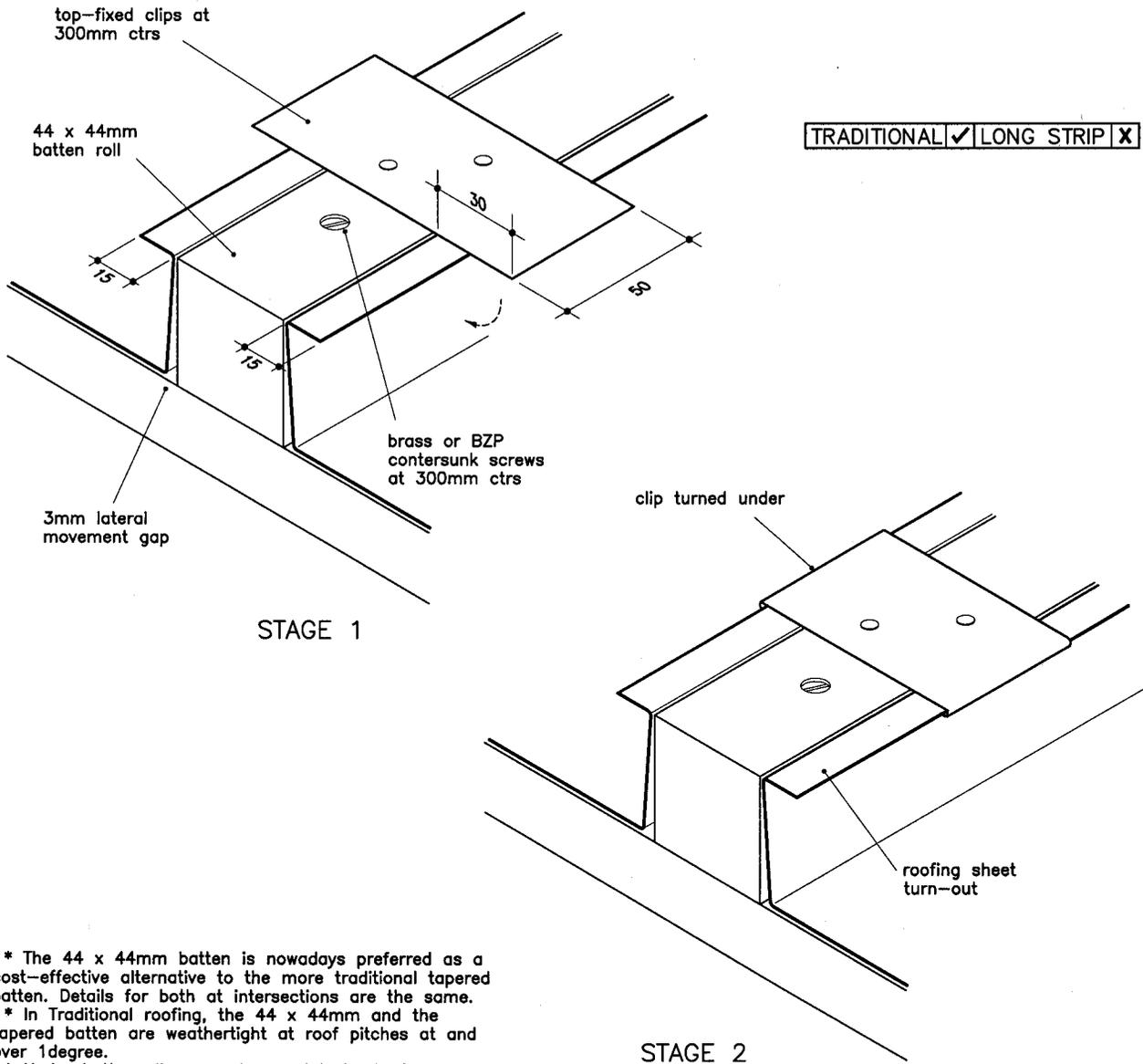


Side elevation Vent hood for low pitches
* Suitable for pitches up to 30degrees.



Section Vent hood for steeper pitches
* Suitable for pitches at and over 30degrees.

Fig 36 Batten roll joint in Traditional



* The 44 x 44mm batten is nowadays preferred as a cost-effective alternative to the more traditional tapered batten. Details for both at intersections are the same.

* In Traditional roofing, the 44 x 44mm and the tapered batten are weathertight at roof pitches at and over 1 degree.

* Under batten clips may be used instead of top-fixed clips.

* For on-site efficiency roofing sheets and cappings can be pre-formed in the workshop.

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm

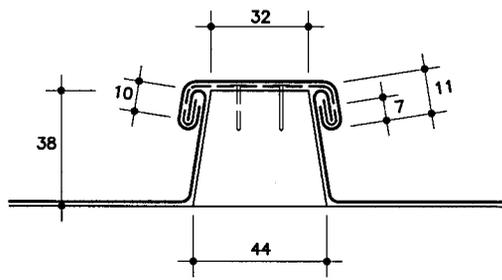


Fig 36a
Section tapered batten

TRADITIONAL ✓ LONG STRIP X

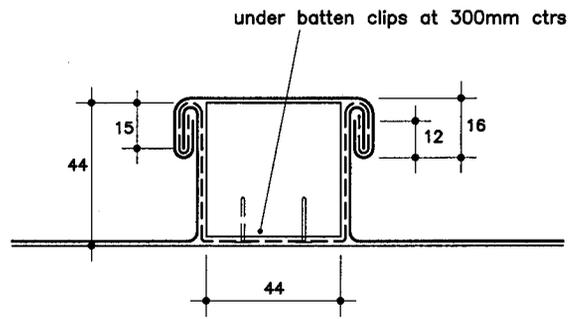


Fig 36b
Alternative with under batten clip

TRADITIONAL ✓ LONG STRIP X

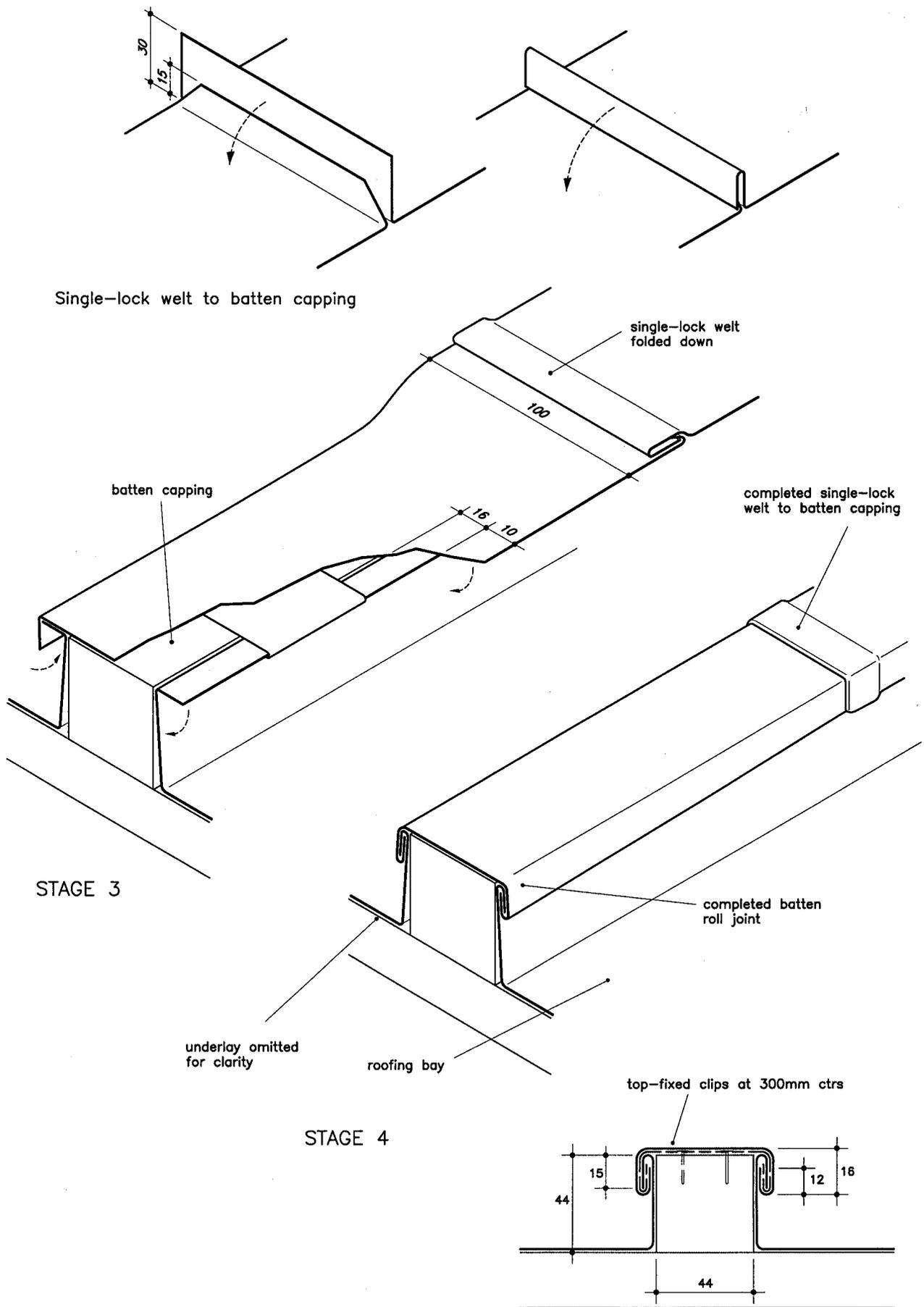


Fig 36c
 Section completed joint
 TRADITIONAL LONG STRIP X

TRADITIONAL LONG STRIP

- * In Long Strip roofing, the 44 x 44mm batten is weathertight at roof pitches at and over 3degrees.
- * Fixed and sliding clips should be provided as set down in Table L p11. For small roofs in Long Strip roofing ie where roofing sheets do not exceed 3m, fixed clips may be used throughout.
- * Joints in the batten capping are made with single-lock welts as shown in Fig 36 (p87).
- * For on-site efficiency roofing sheets and cappings can be pre-formed in the workshop.

Temper: quarter- or half-hard
Thickness: 0.6mm or 0.7mm

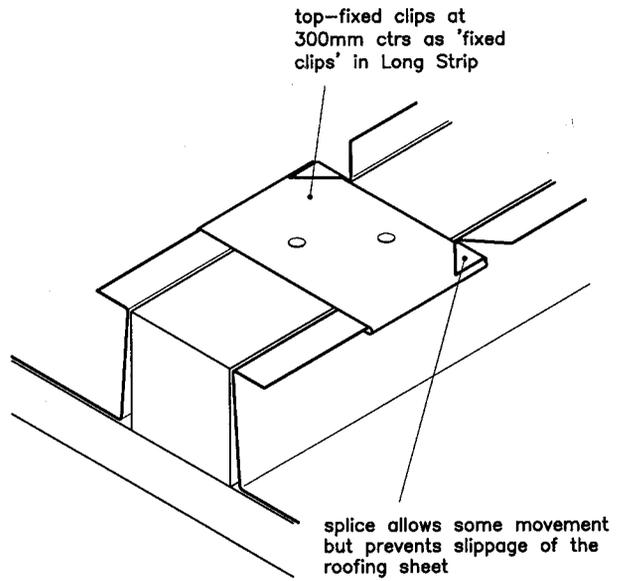
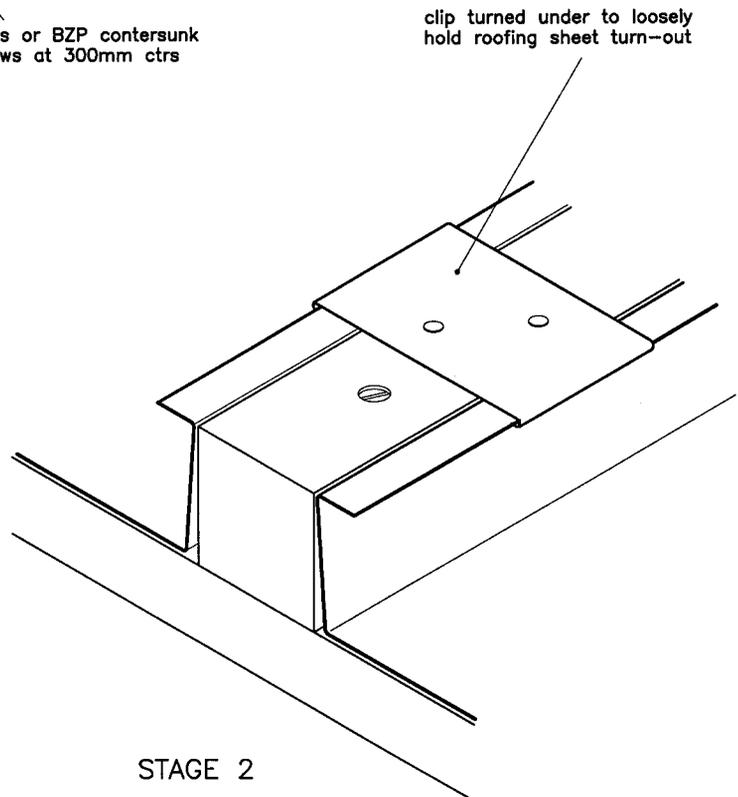
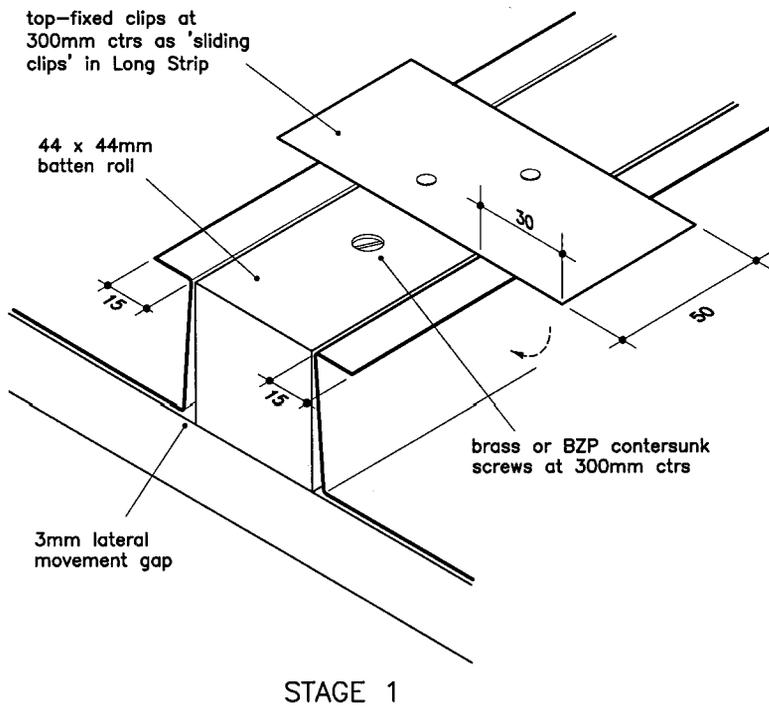


Fig 37a
Top batten clip as 'fixed clip'
TRADITIONAL LONG STRIP



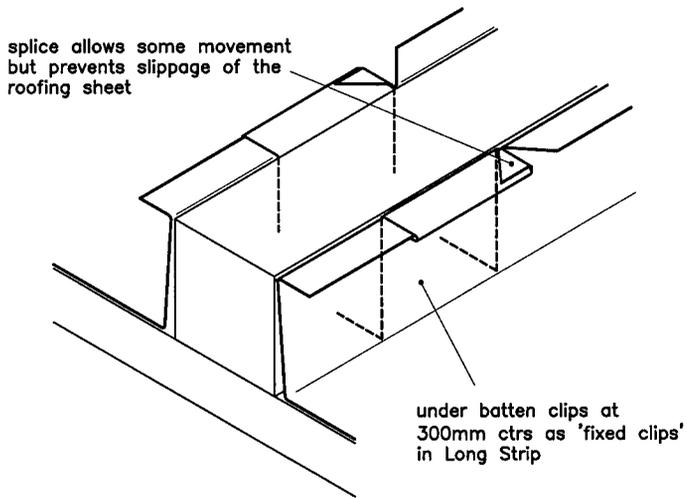


Fig 37b
Under batten clip as 'fixed clip'
TRADITIONAL LONG STRIP

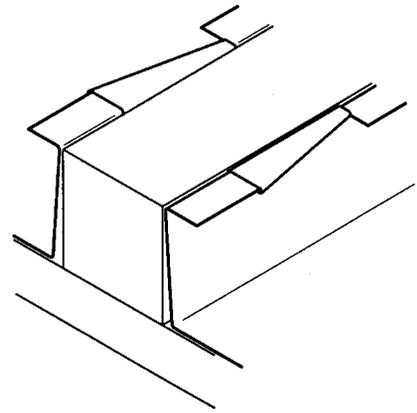
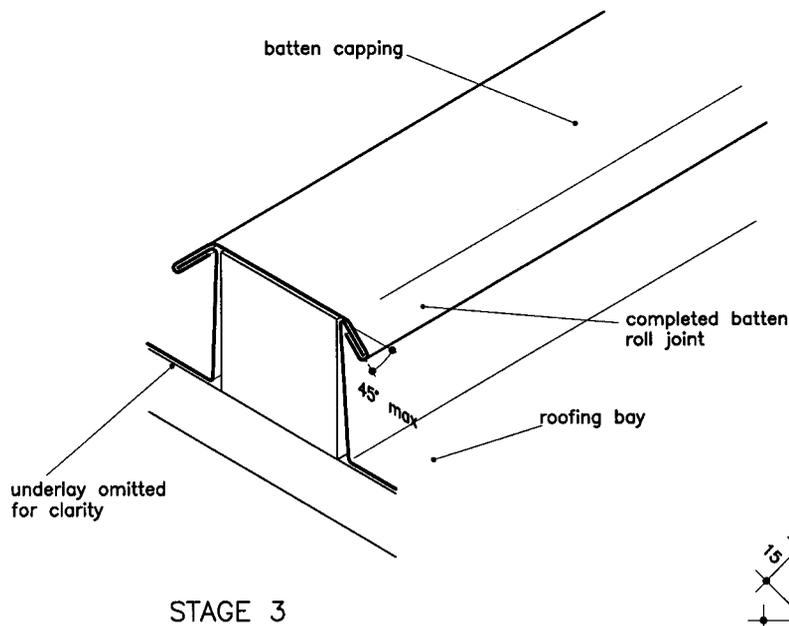


Fig 37c
Alternative under batten clip as 'fixed clip'
TRADITIONAL LONG STRIP



STAGE 3

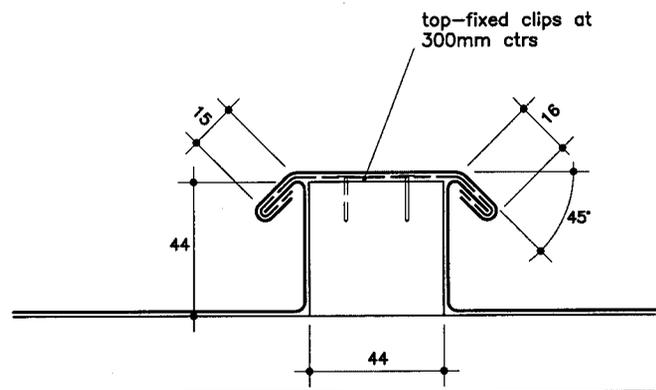


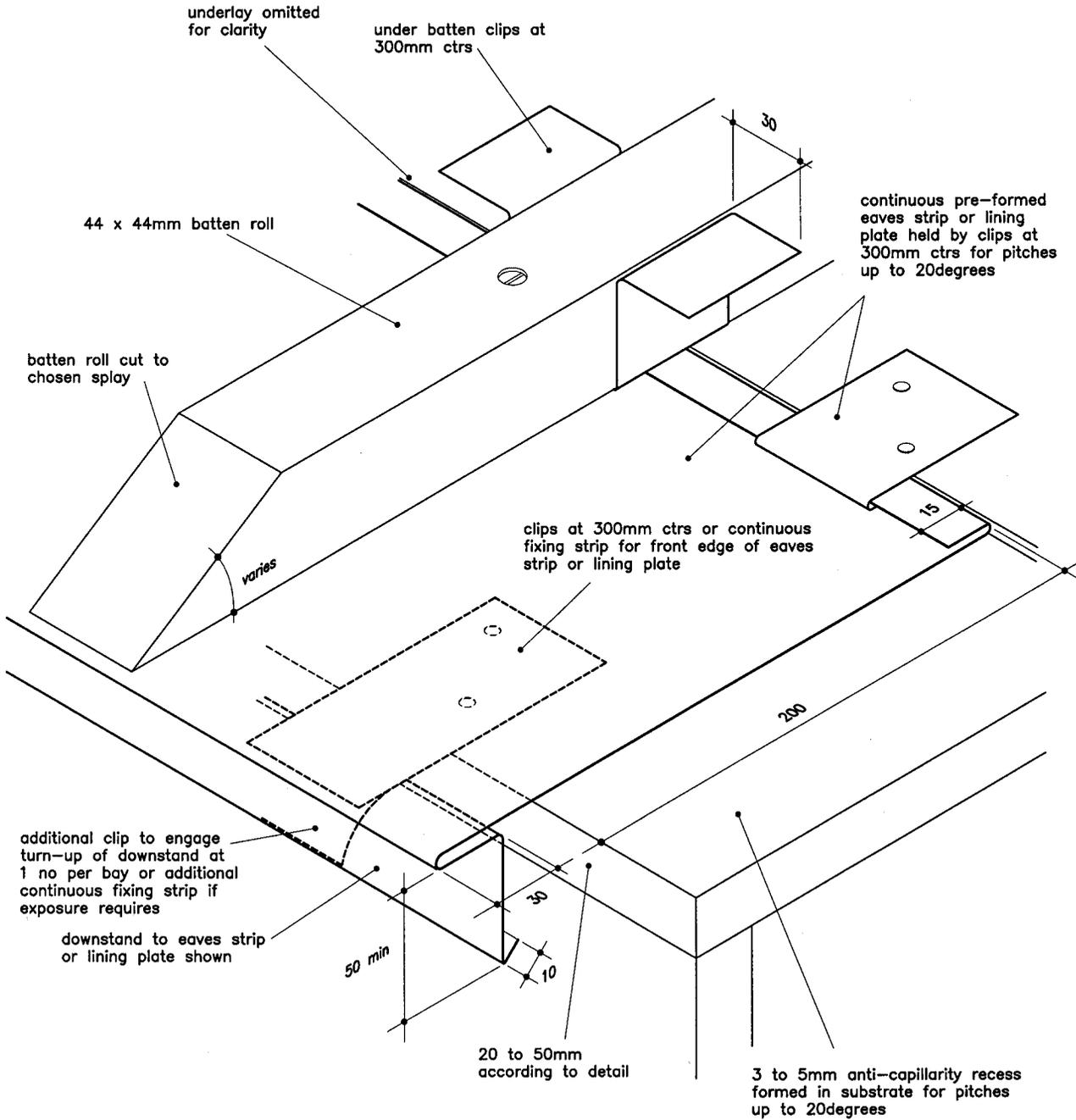
Fig 37d
Section completed joint
TRADITIONAL LONG STRIP

Fig 38 Splayed batten roll end with dog-ear fold

TRADITIONAL ✓ LONG STRIP ✓

* The detail shown can also be used in Traditional roofing, except that the 10mm movement gap at the roofing sheet turn-under is not required. The capping turn-outs can be dressed down in Traditional.
 * For joints in eaves strips and lining plates see Fig 26 (p72).

Temper: soft, quarter- or half-hard
 Thickness: 0.6mm or 0.7mm



STAGE 1

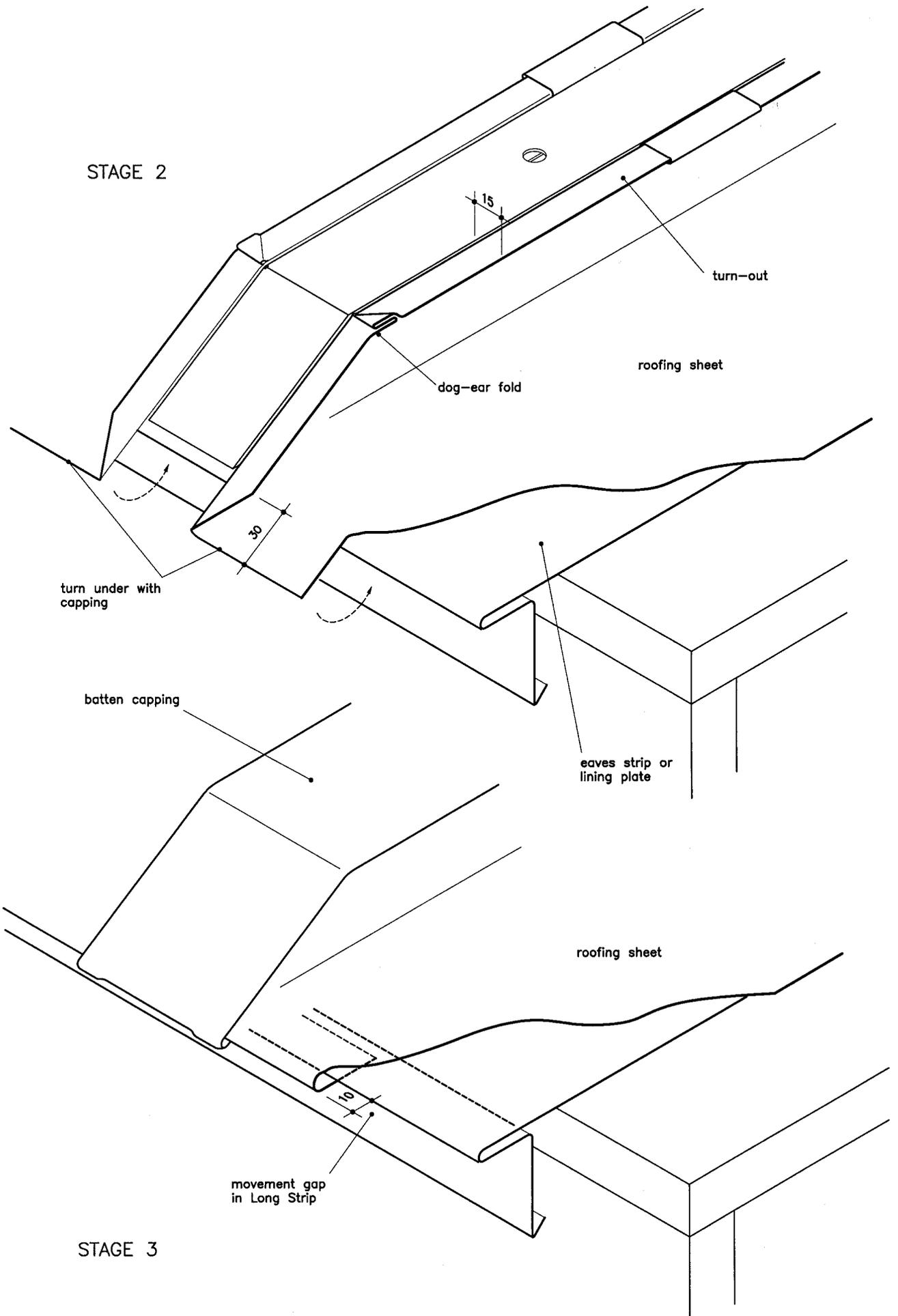


Fig 39 Splayed batten roll end with additional batten end cover

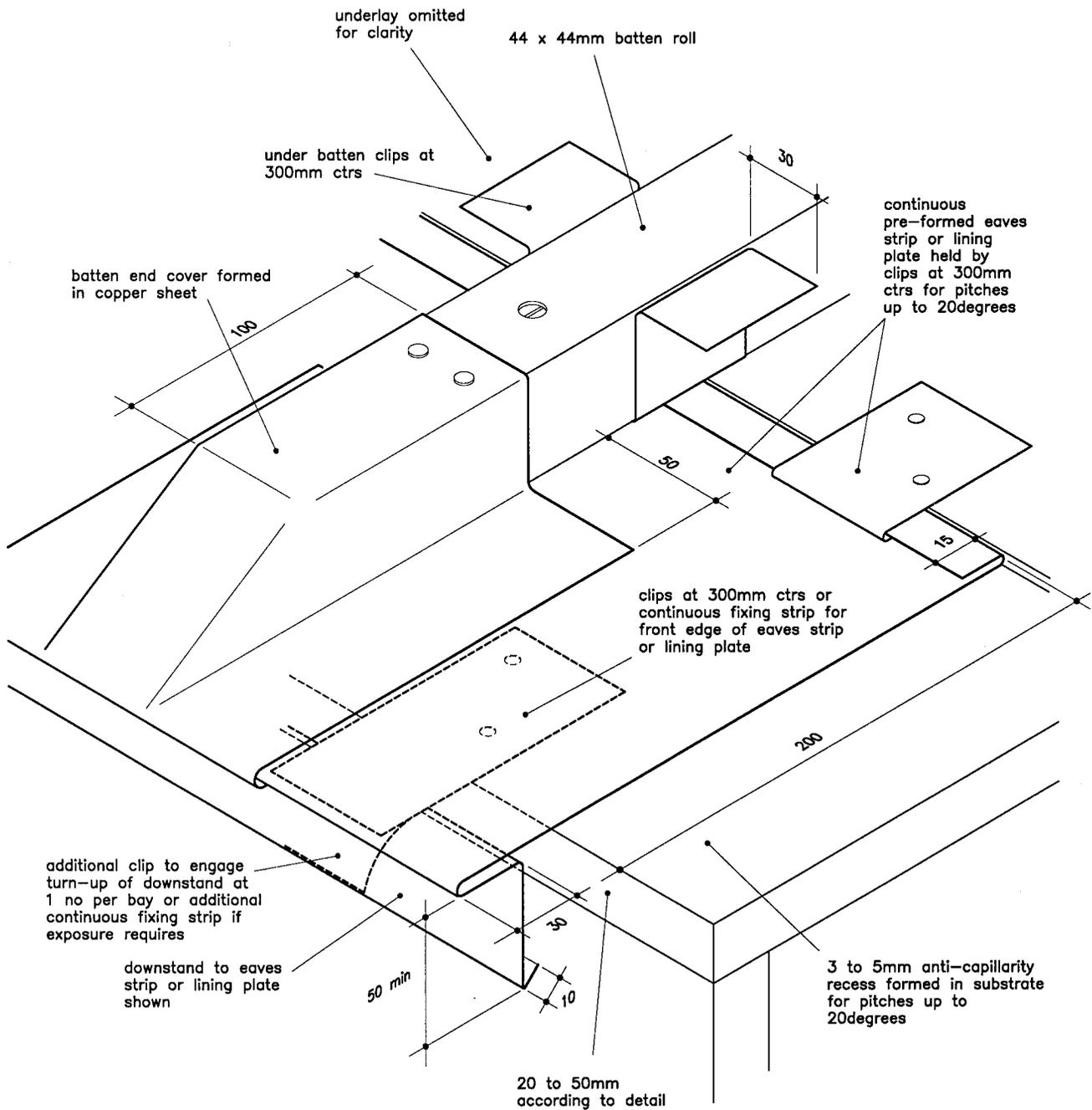
TRADITIONAL ✓ LONG STRIP ✓

* This alternative to Fig 38 is easier to form because the dog-ear fold can be avoided by simply making a cut in the turn-out. However it does require the batten end cover to ensure that water does not penetrate to the batten.

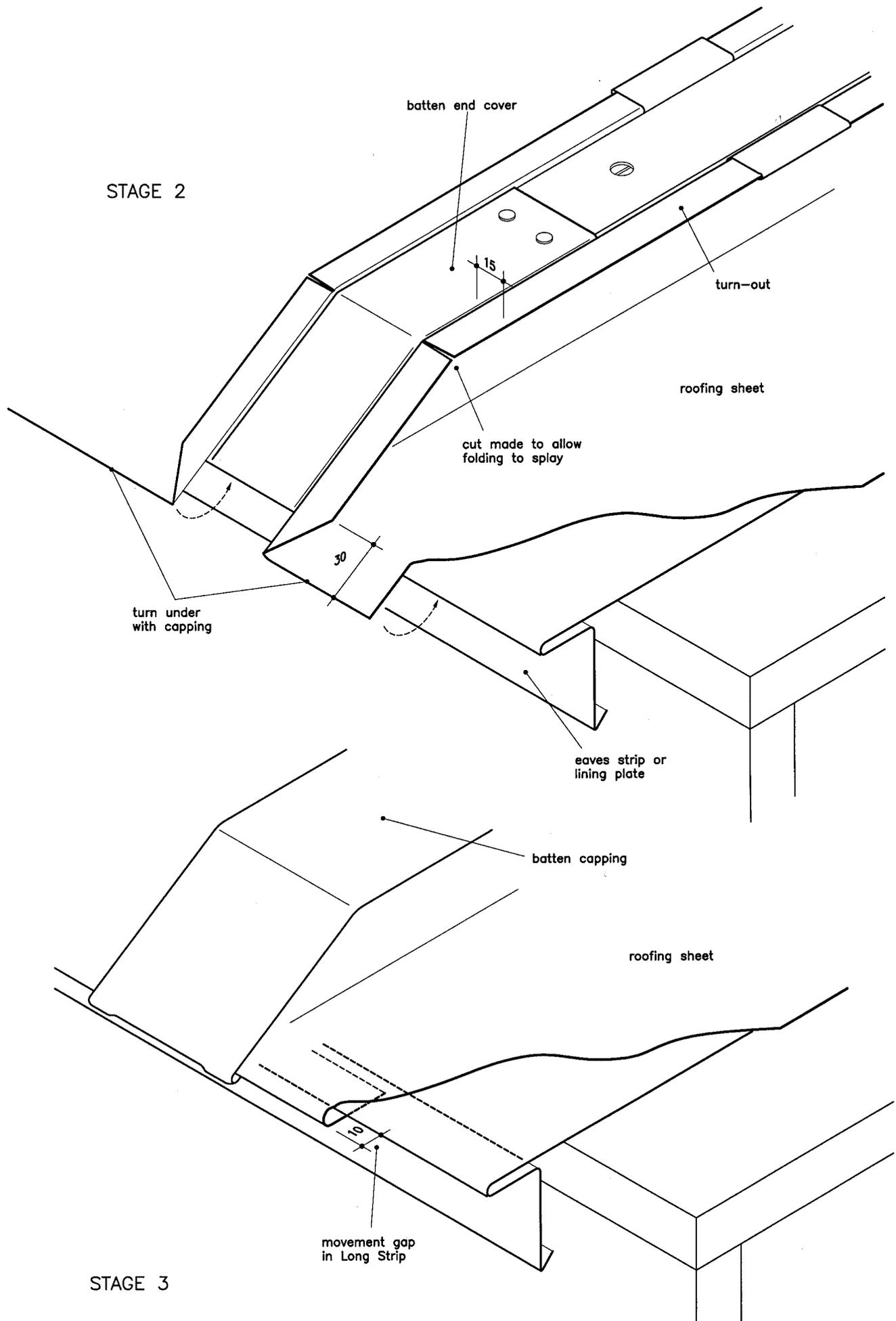
* The detail shown can also be used in Traditional roofing, except that the 10mm movement gap at the roofing sheet turn-under is not required. The capping turn-outs can be dressed down in Traditional.

* For joints in eaves strips and lining plates see Fig 26 (p72).

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm



STAGE 1



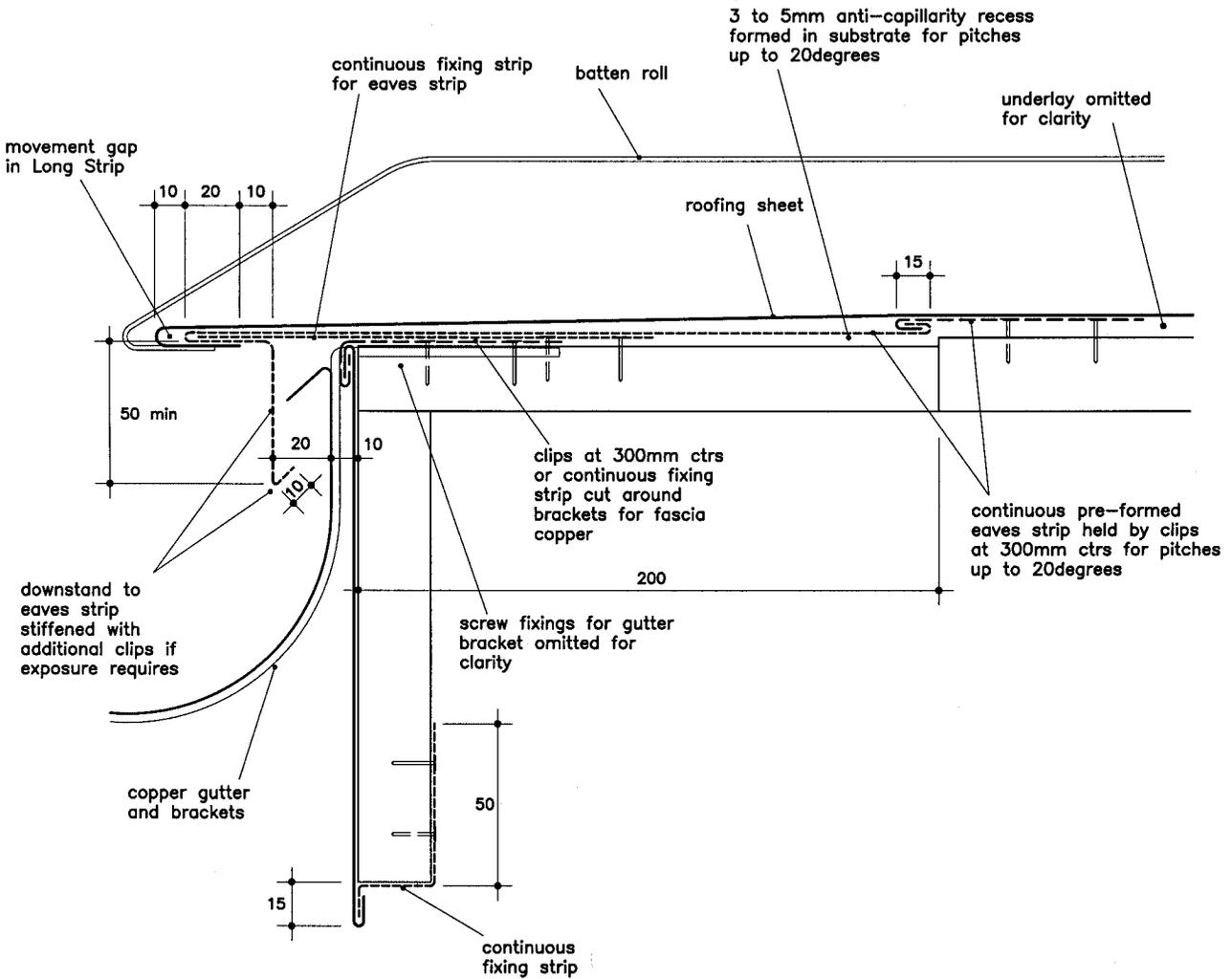


Fig 40a
 Splayed batten roll end at copper clad fascia
 TRADITIONAL ✓ LONG STRIP ✓

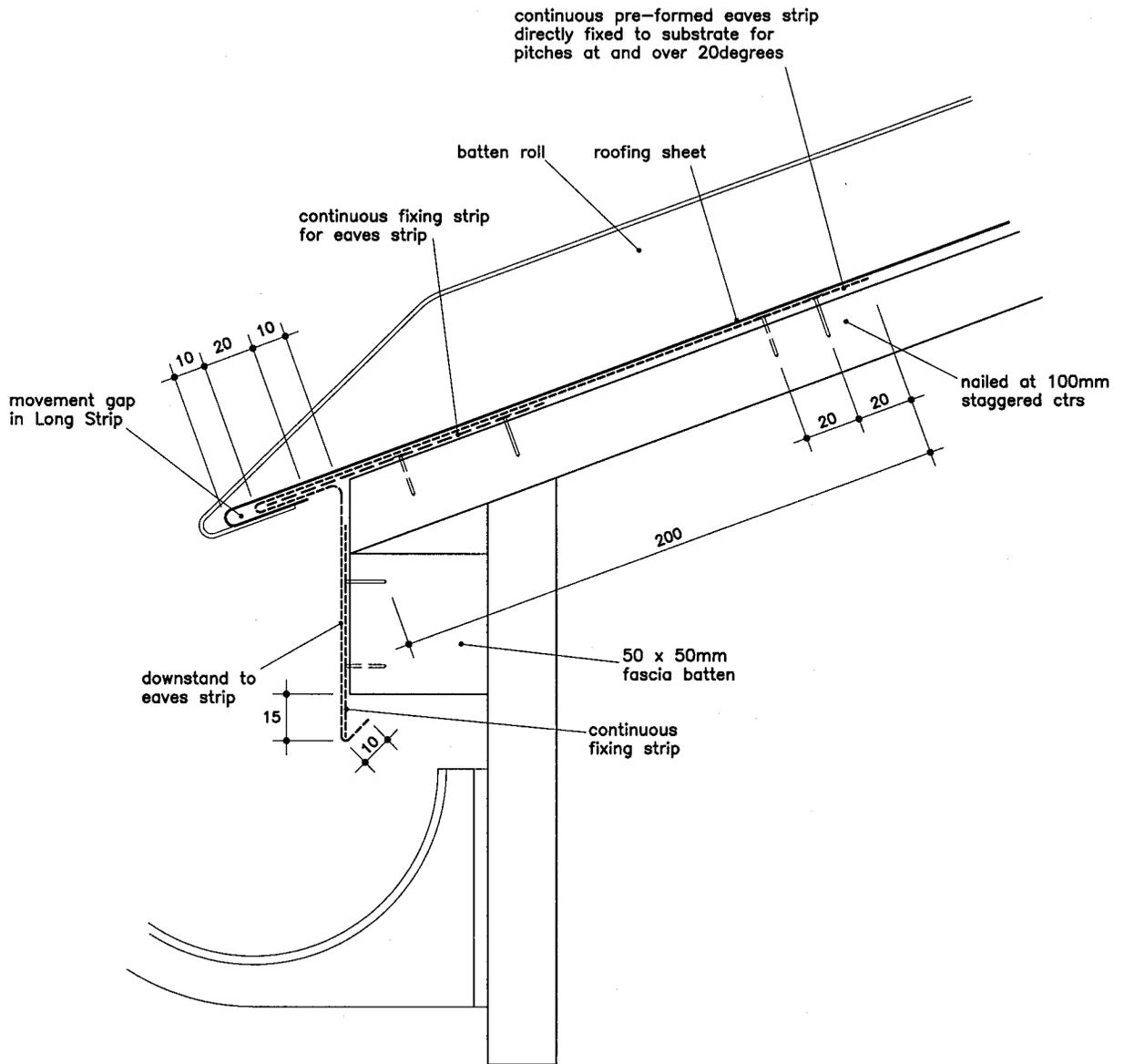


Fig 40b
Splayed batten roll end at timber fascia

TRADITIONAL LONG STRIP

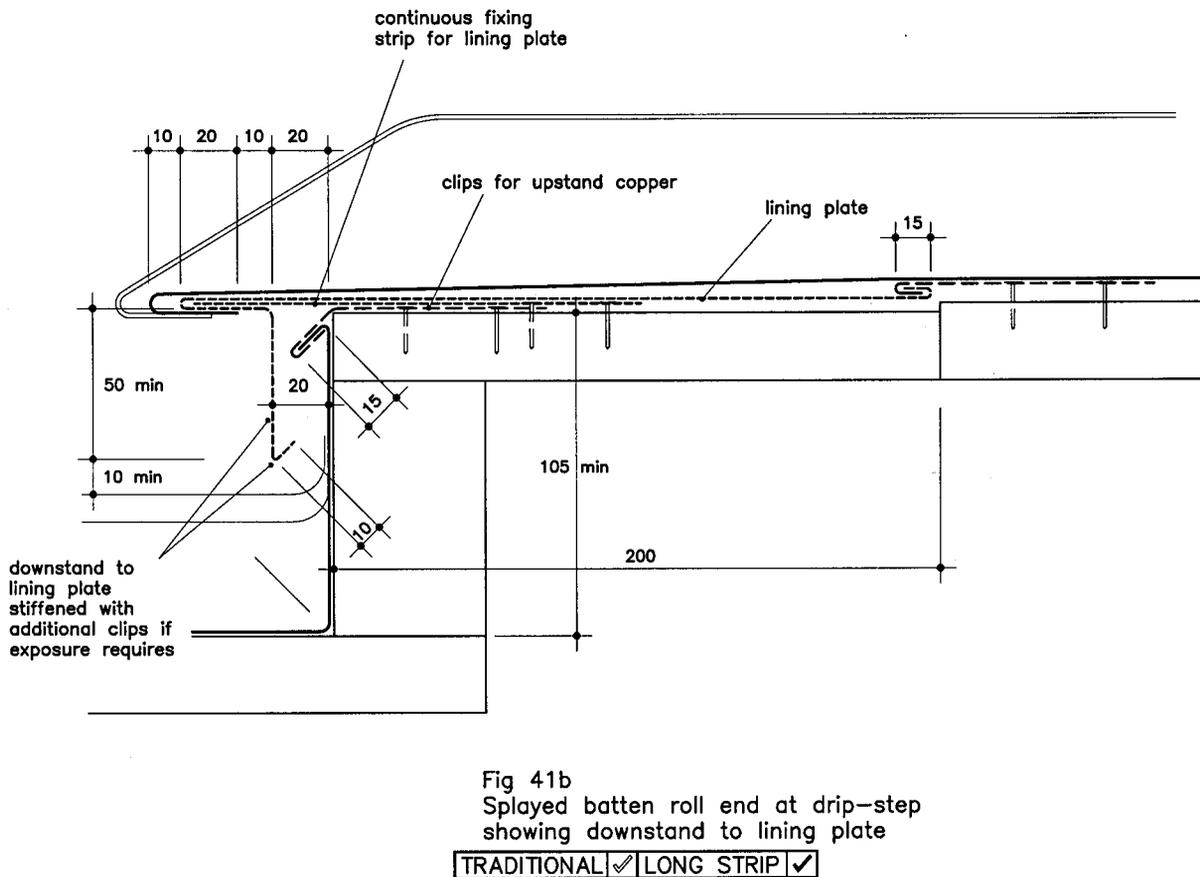
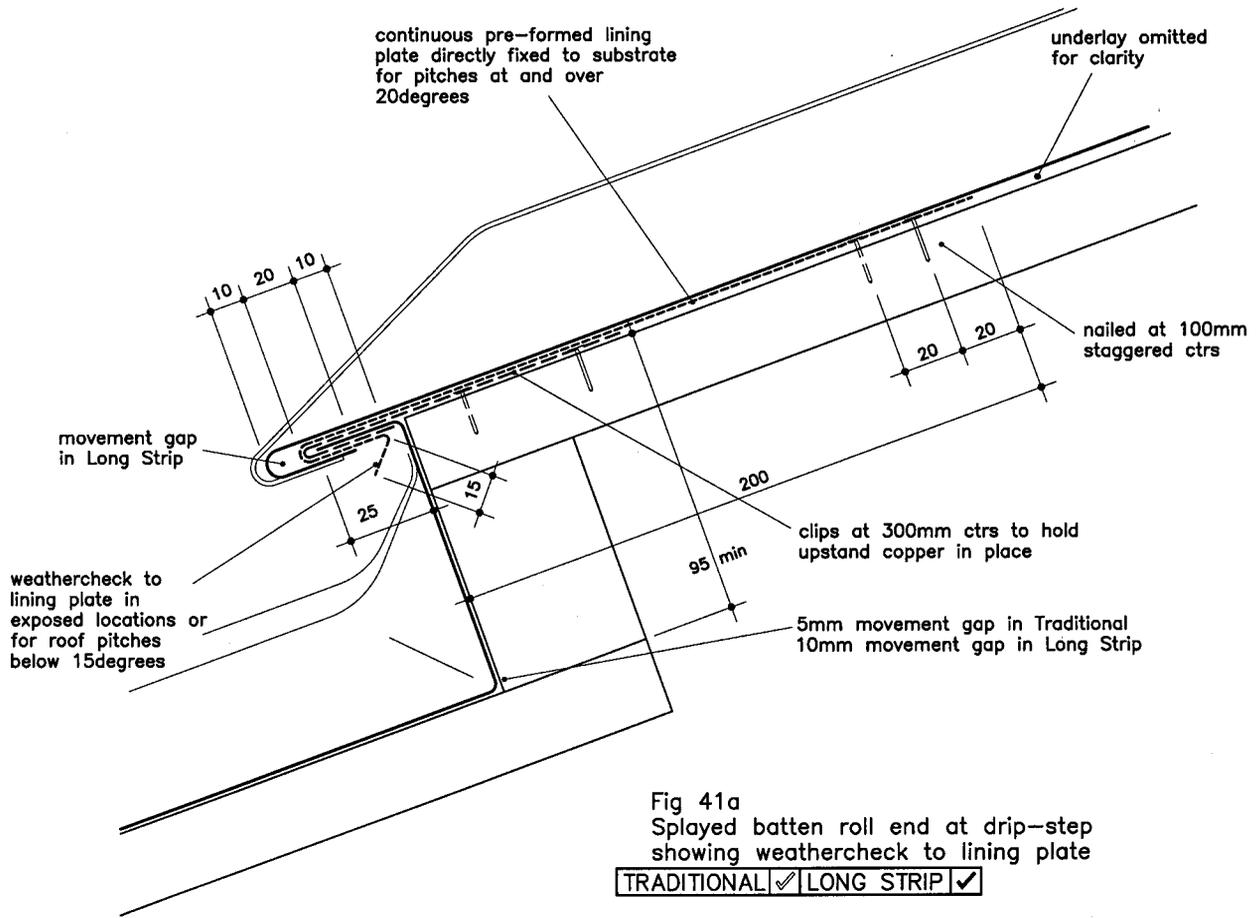
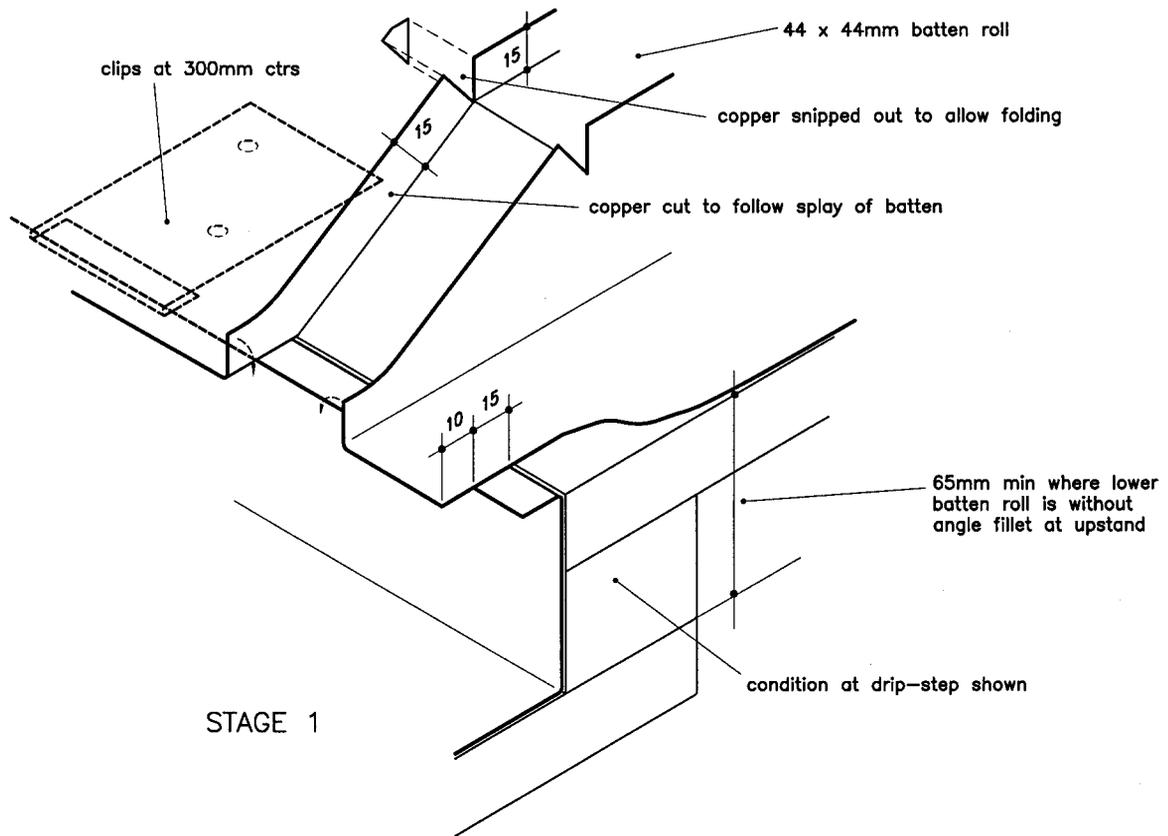


Fig 42 Splayed batten roll end with separate end capping

TRADITIONAL LONG STRIP



* This detail shows the usual method of finishing a batten roll end in Traditional roofing. Those shown in Figs 38 and 39 are alternatives, with the difference that the 10mm movement gap shown in those figures is not required.

Temper: soft or quarter-hard
Thickness: 0.6mm or 0.7mm

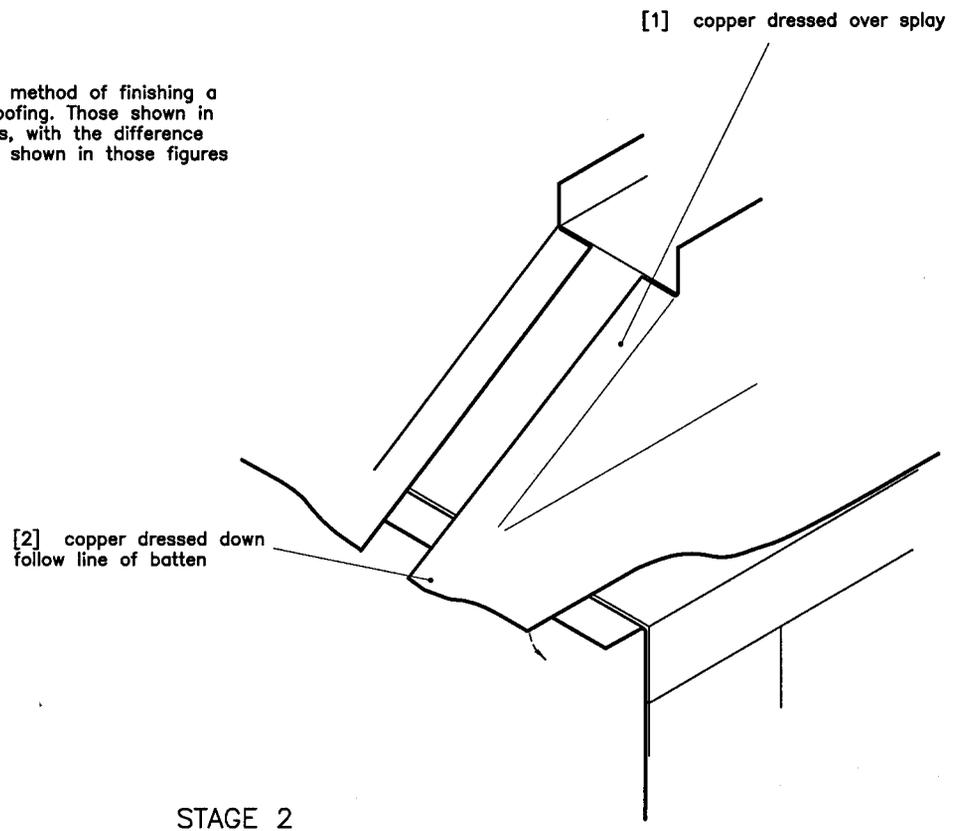
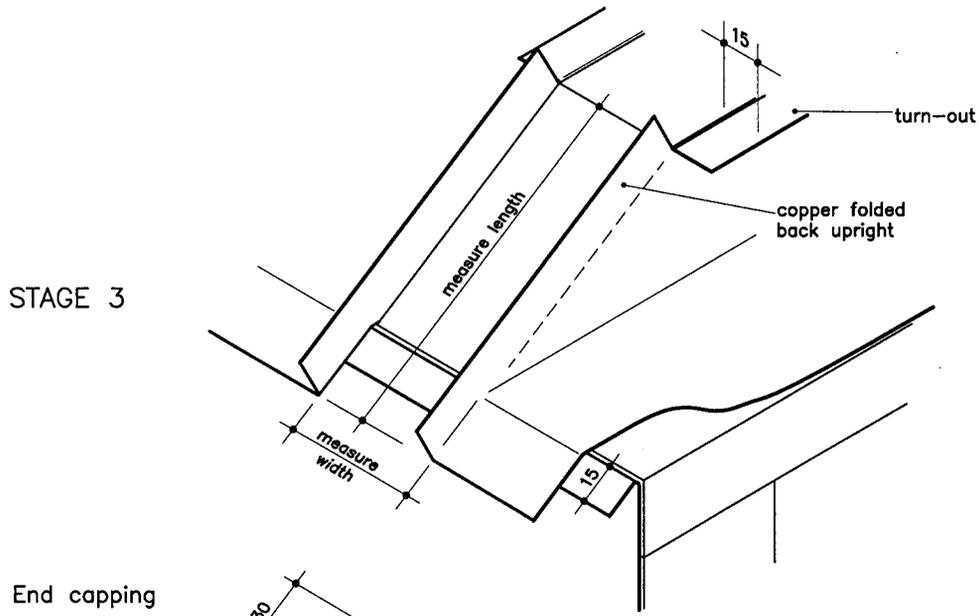
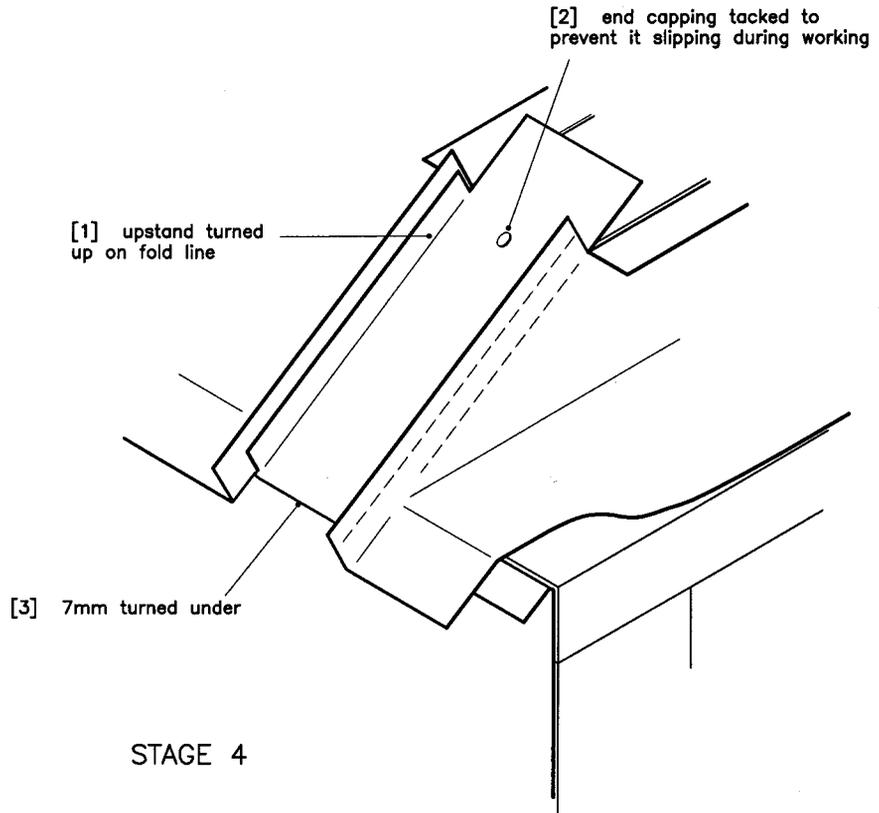
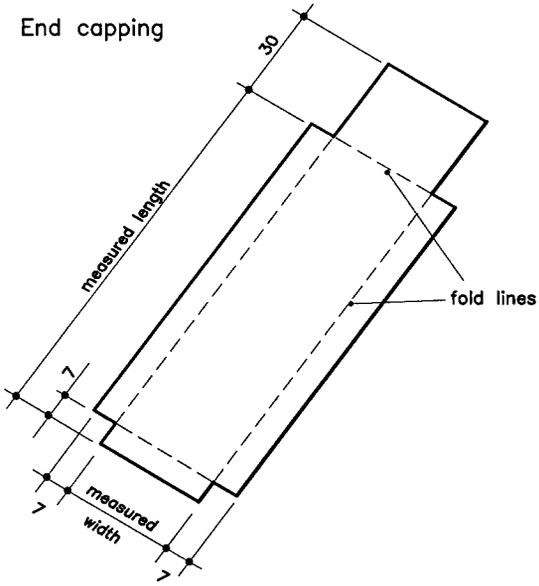


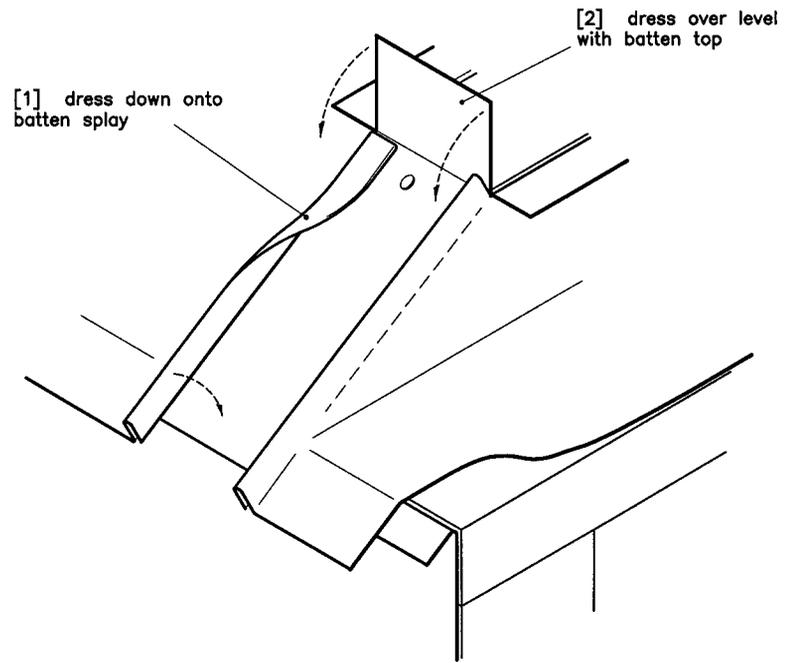
Fig 42 Splayed batten roll end with separate end capping



End capping



STAGE 6



STAGE 5

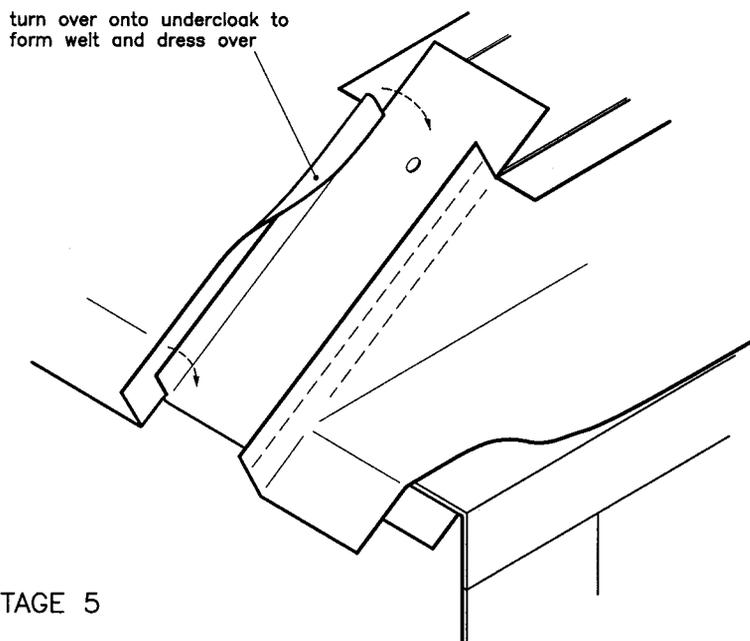
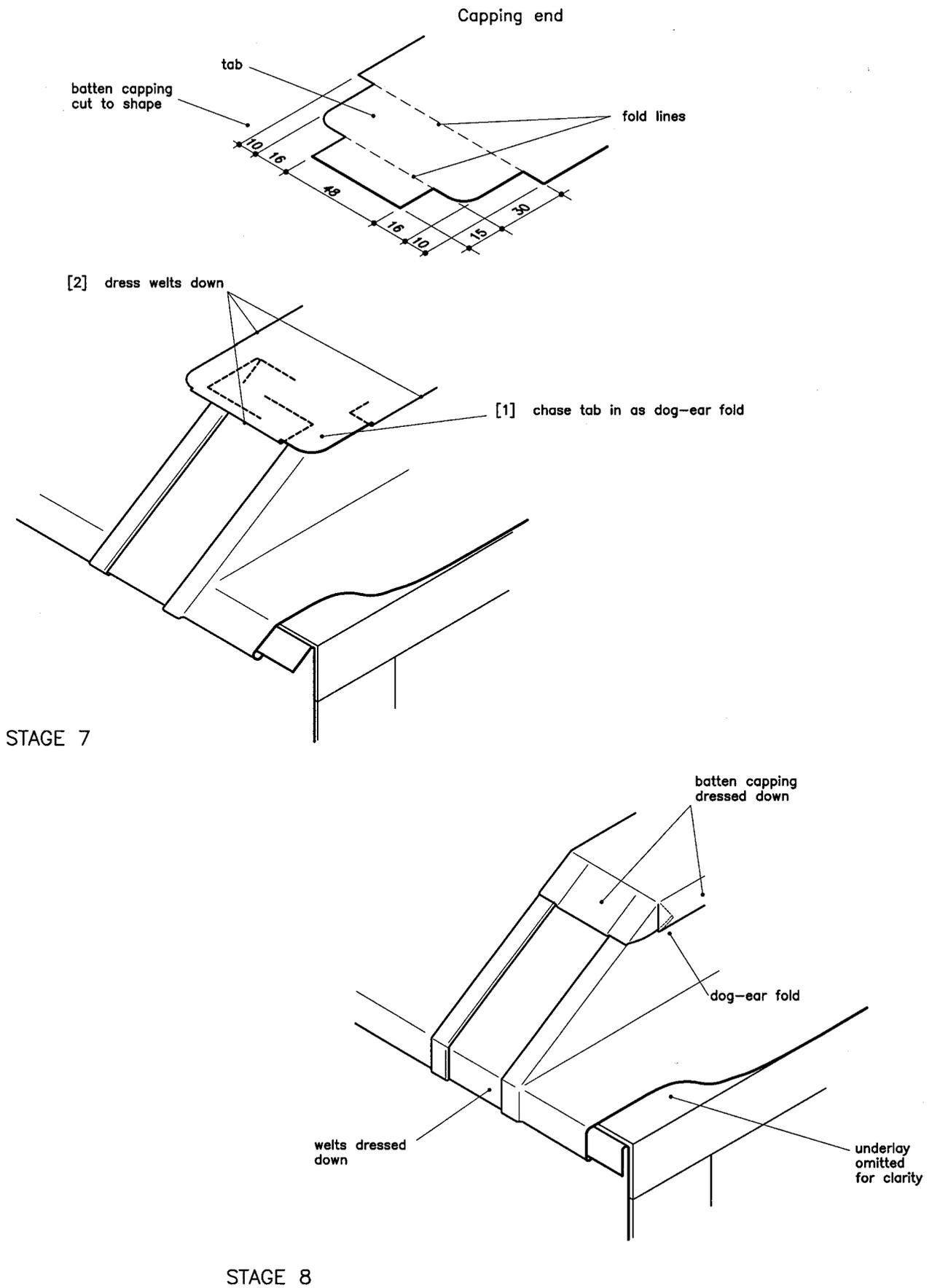


Fig 42 Splayed batten roll end with separate end capping



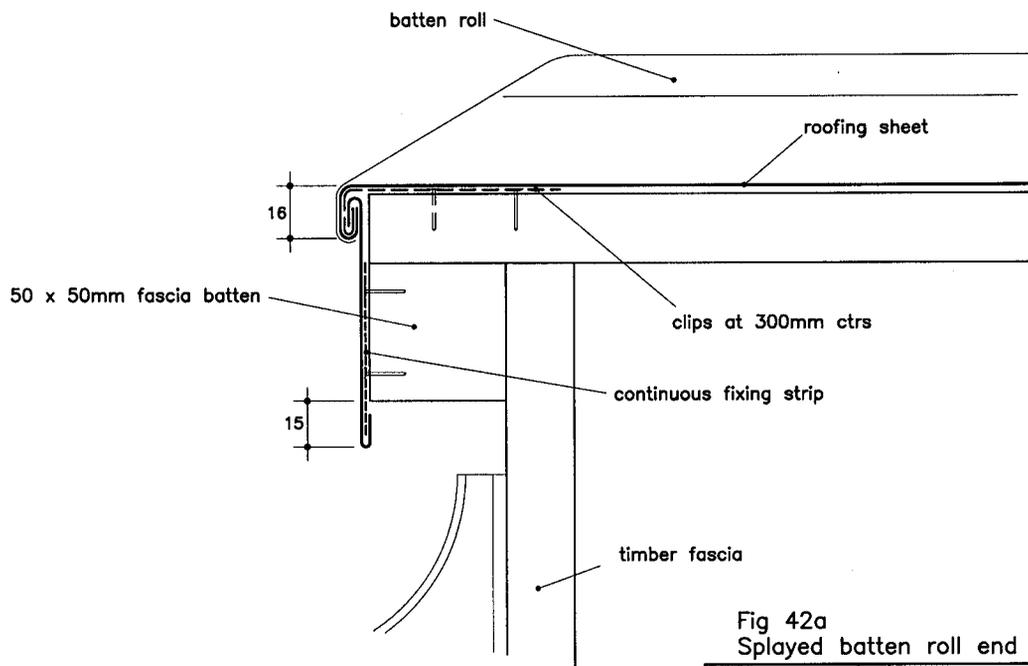


Fig 42a
Splayed batten roll end at timber fascia
TRADITIONAL ✓ LONG STRIP ✗

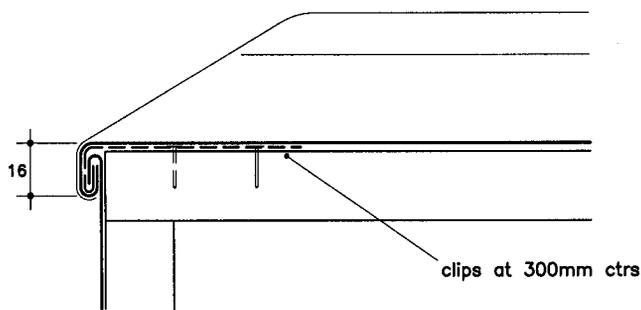


Fig 42b
Splayed batten roll end at parapet gutter
TRADITIONAL ✓ LONG STRIP ✗

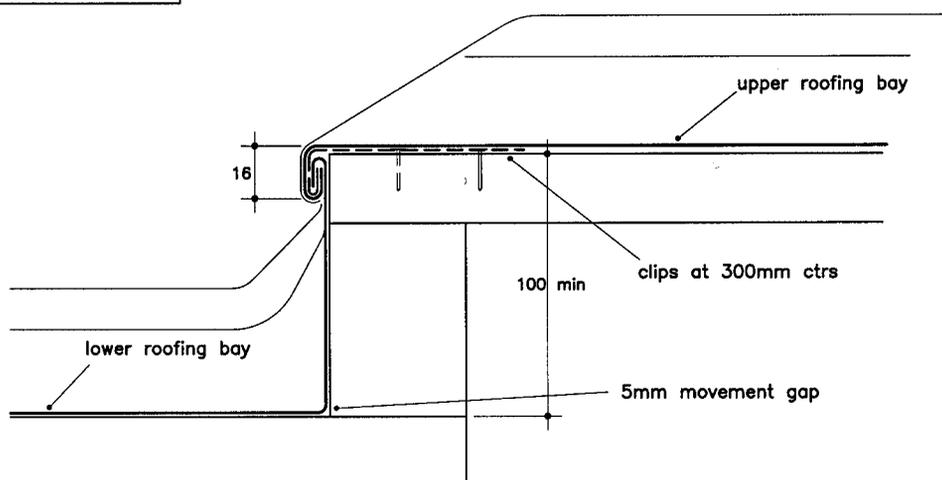
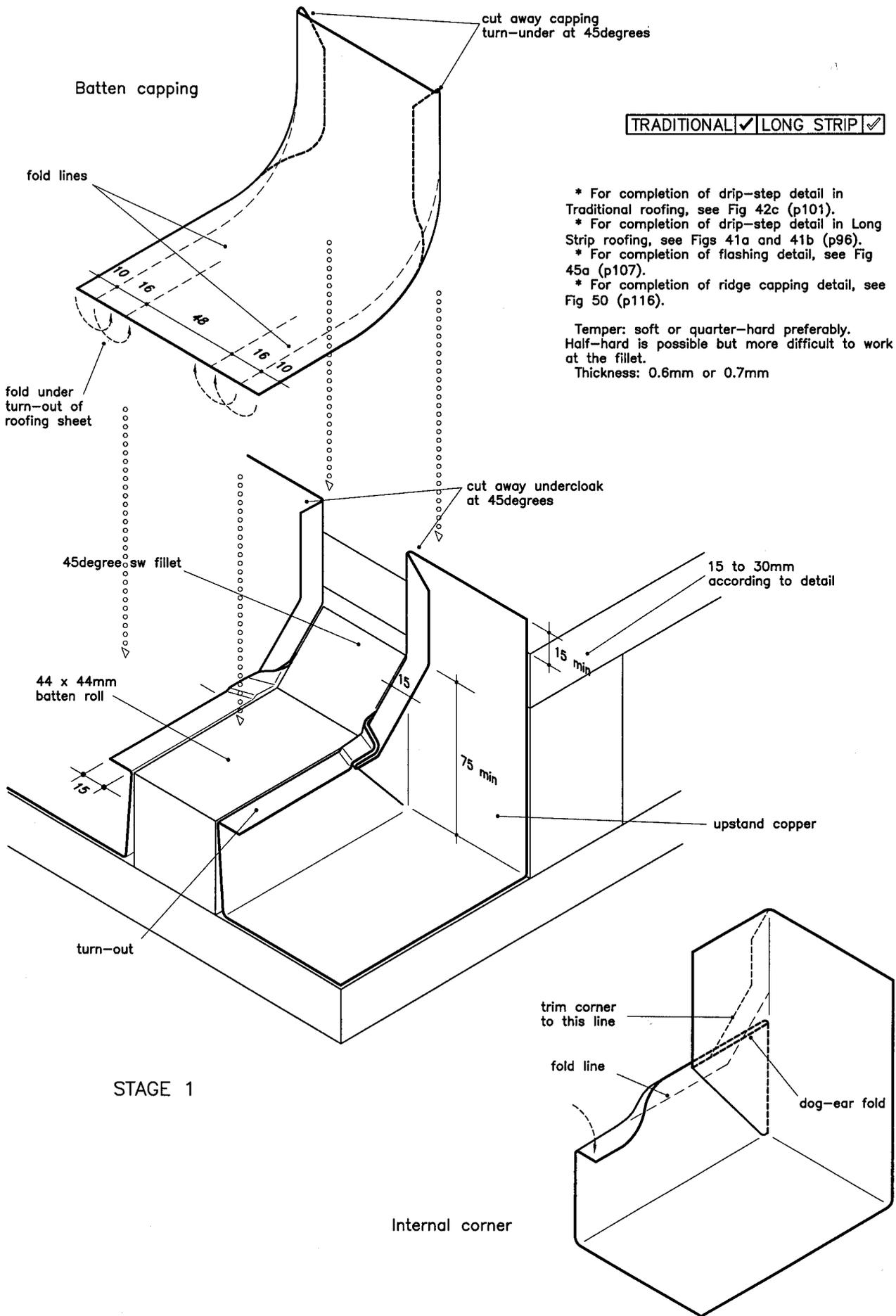


Fig 42c
Splayed batten roll end at drip-step
TRADITIONAL ✓ LONG STRIP ✗

Fig 43 Batten roll with 45degrees fillet at vertical upstand



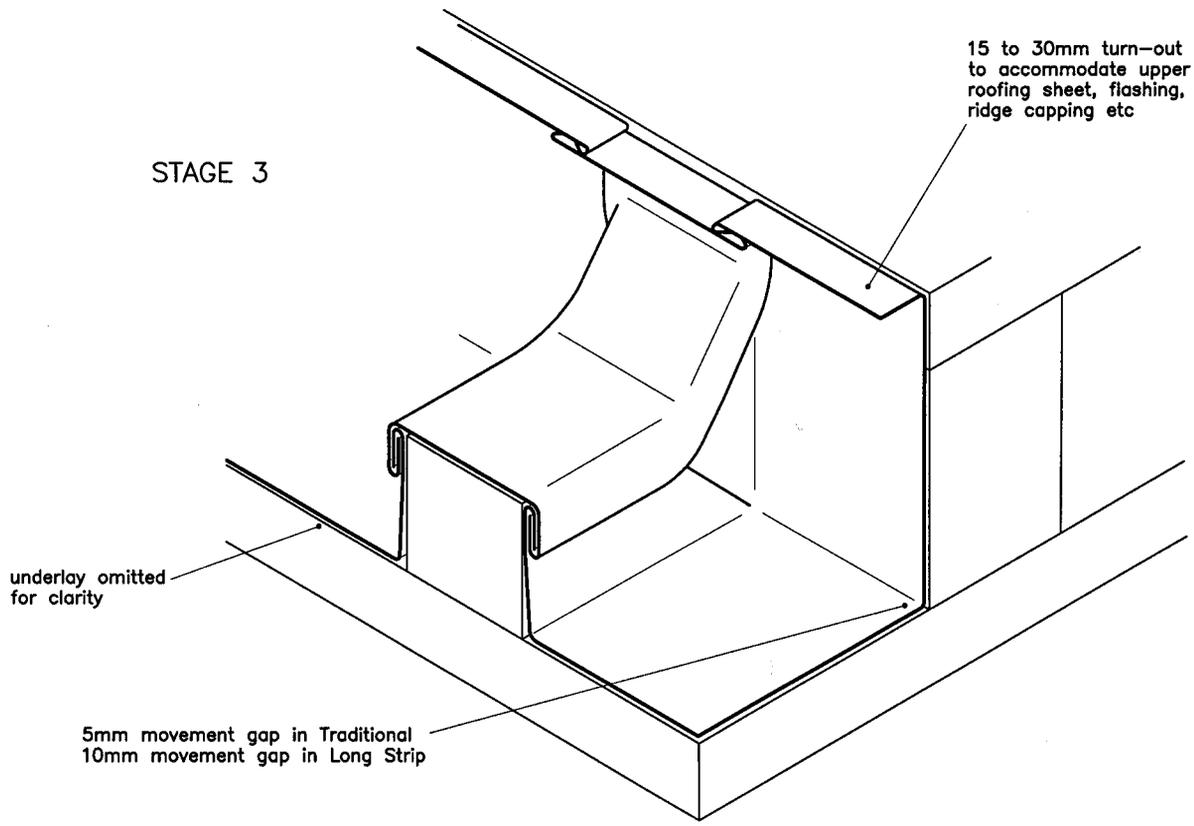
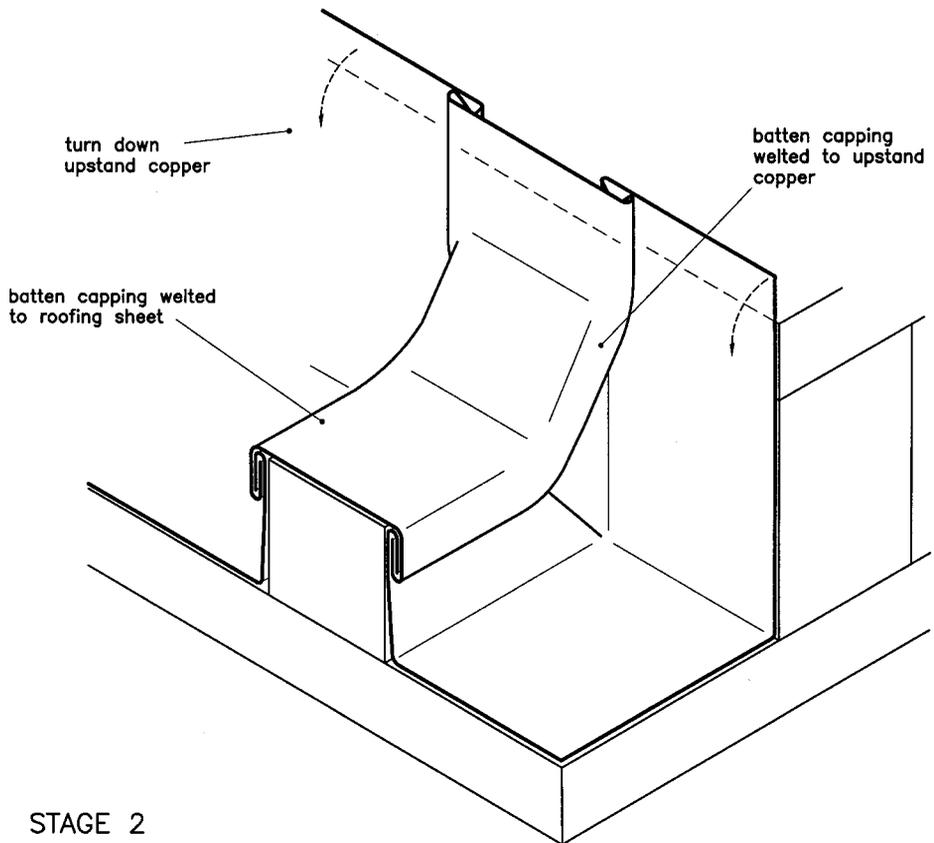
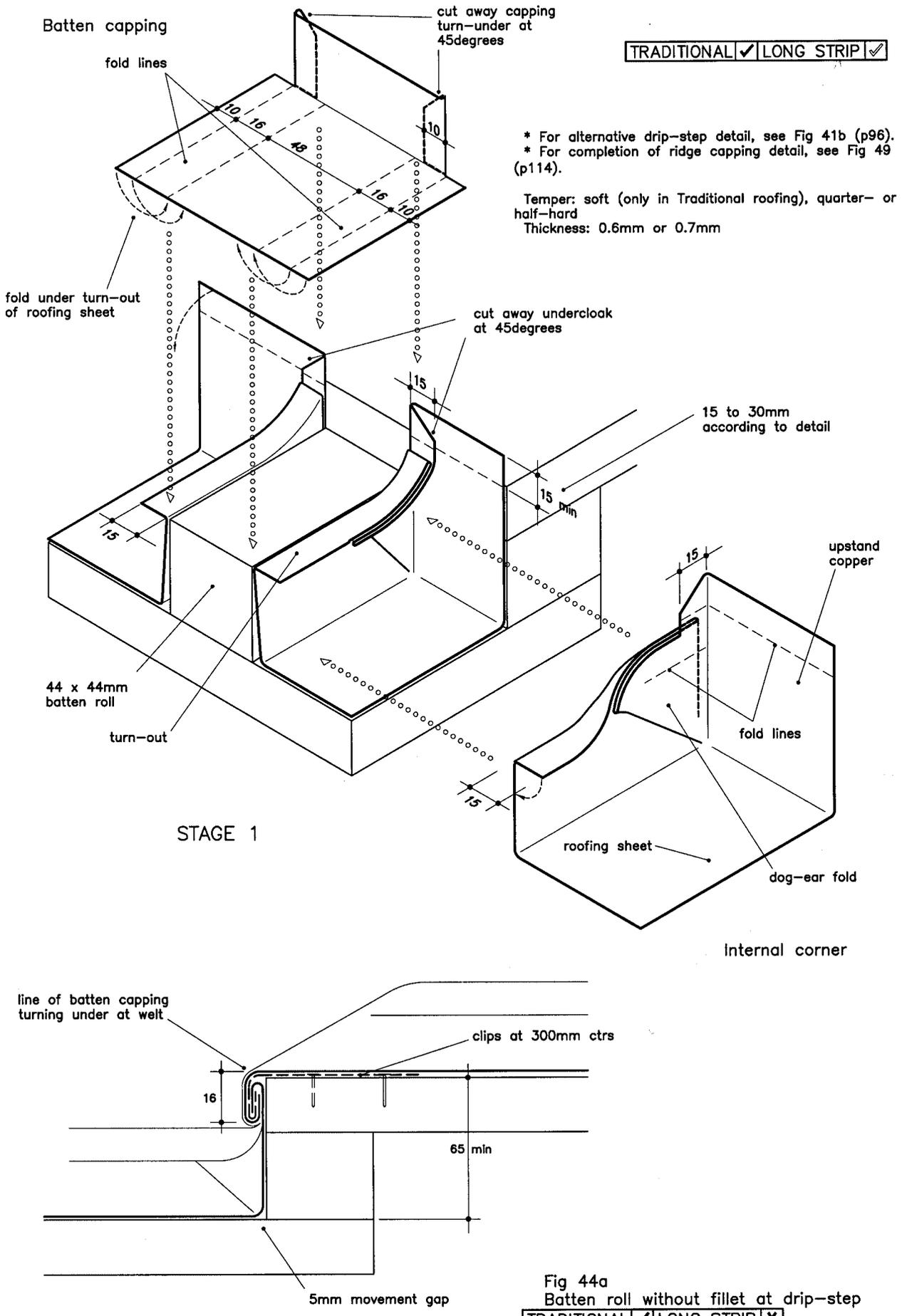


Fig 44 Batten roll without angle fillet at vertical upstand



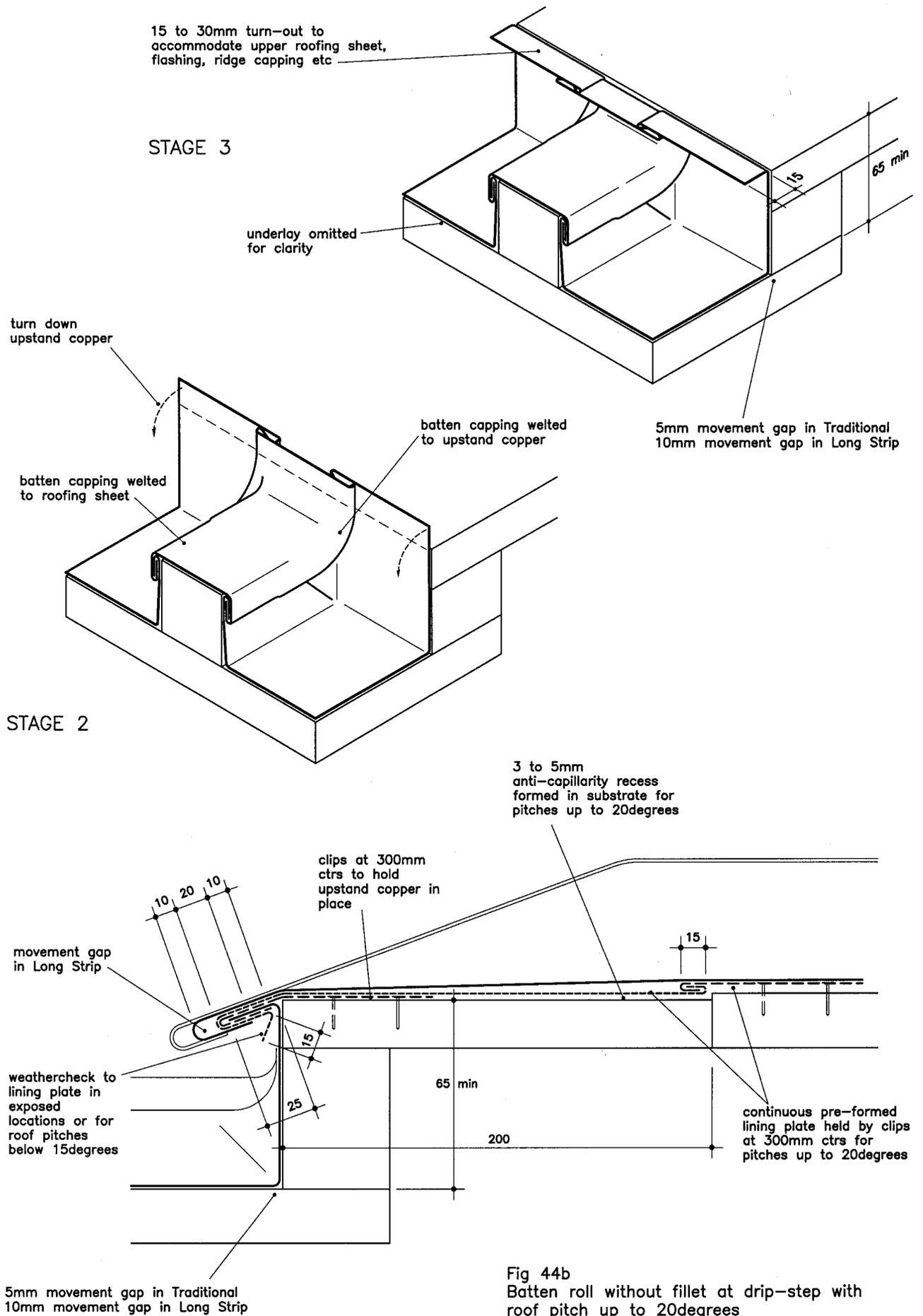
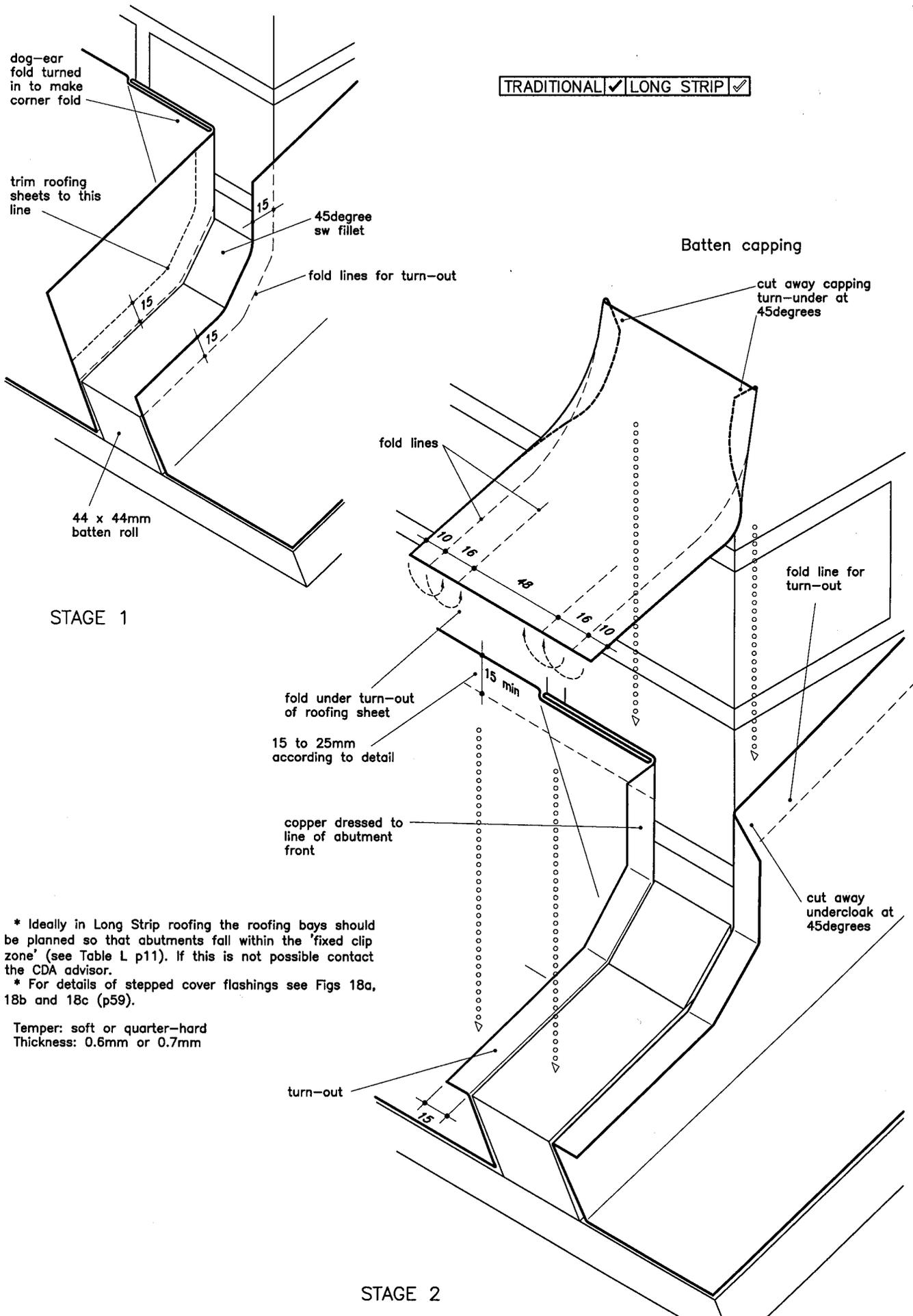


Fig 45 Batten roll at external corner



* Ideally in Long Strip roofing the roofing bays should be planned so that abutments fall within the 'fixed clip zone' (see Table L p11). If this is not possible contact the CDA advisor.
 * For details of stepped cover flashings see Figs 18a, 18b and 18c (p59).

Temper: soft or quarter-hard
 Thickness: 0.6mm or 0.7mm

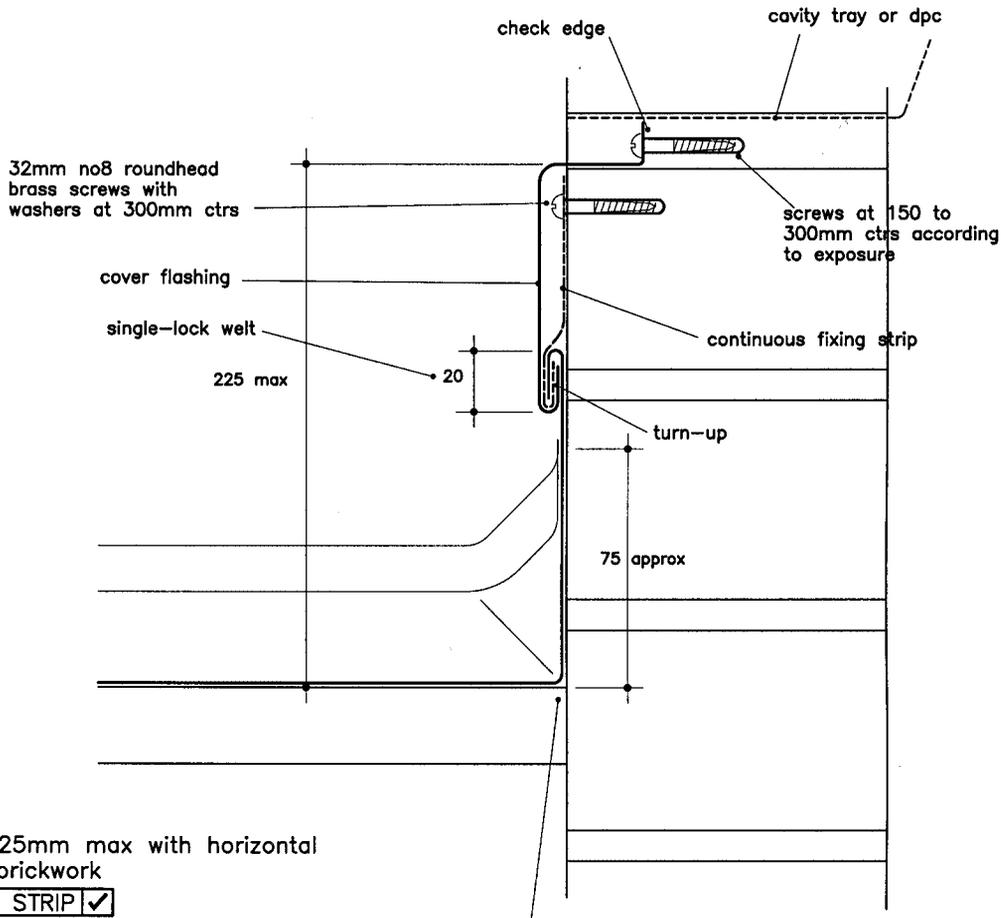
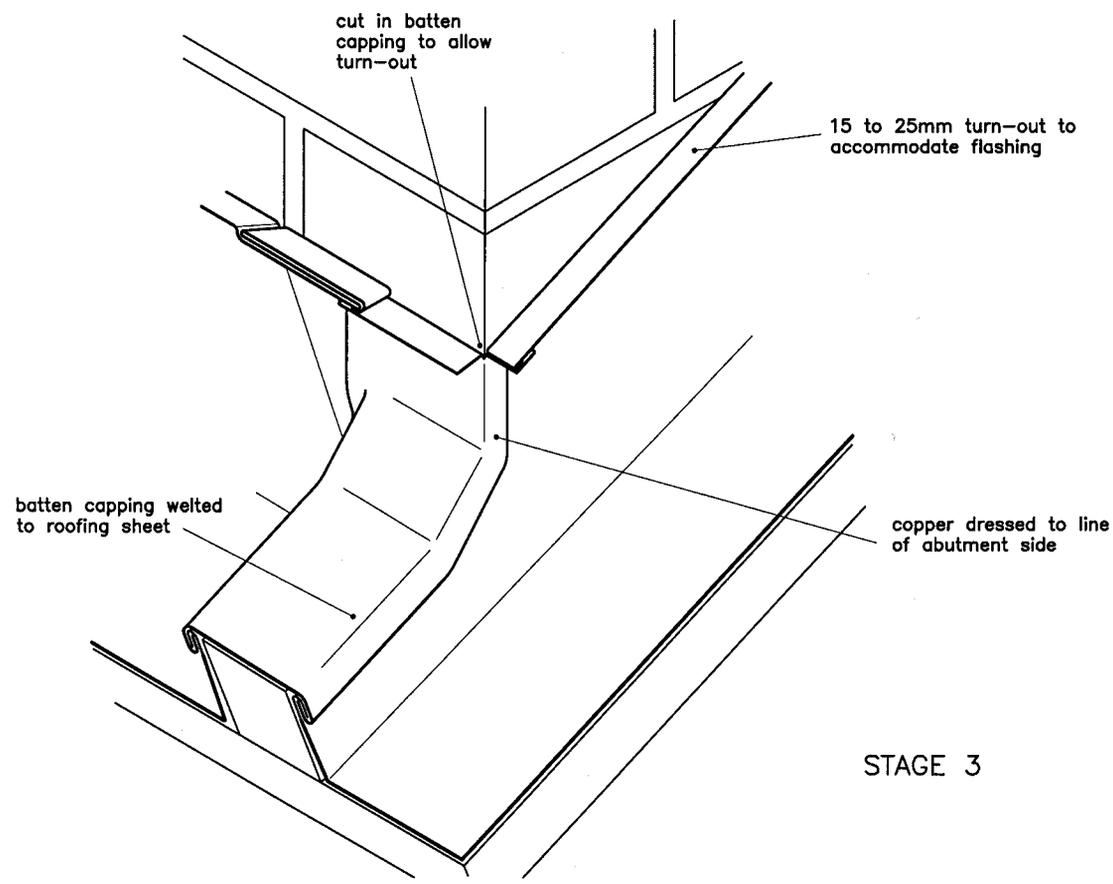


Fig 45a
 Vertical upstand 225mm max with horizontal
 cover flashing to brickwork

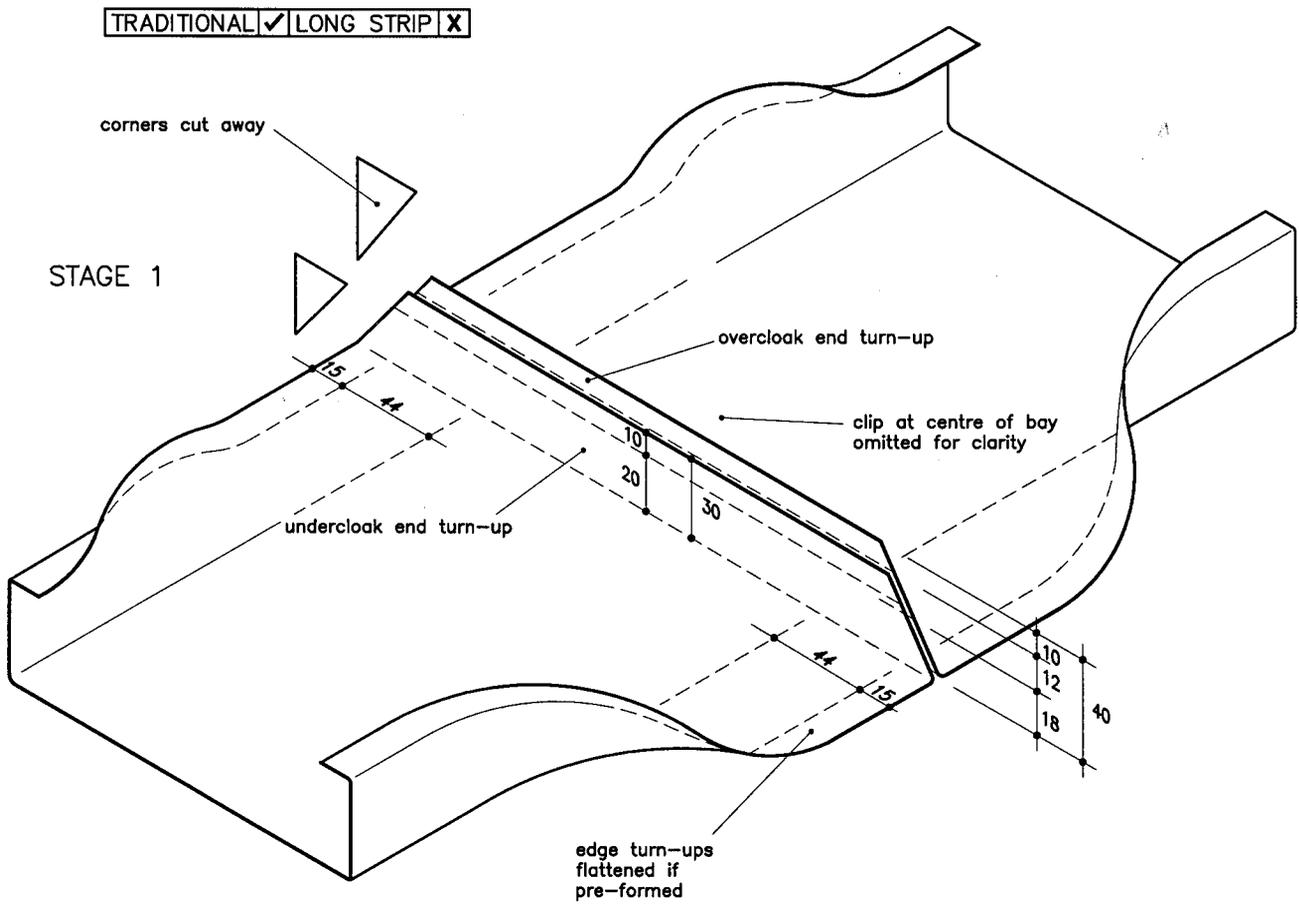
TRADITIONAL ✓ LONG STRIP ✓

5mm movement gap in Traditional
 10mm movement gap in Long Strip



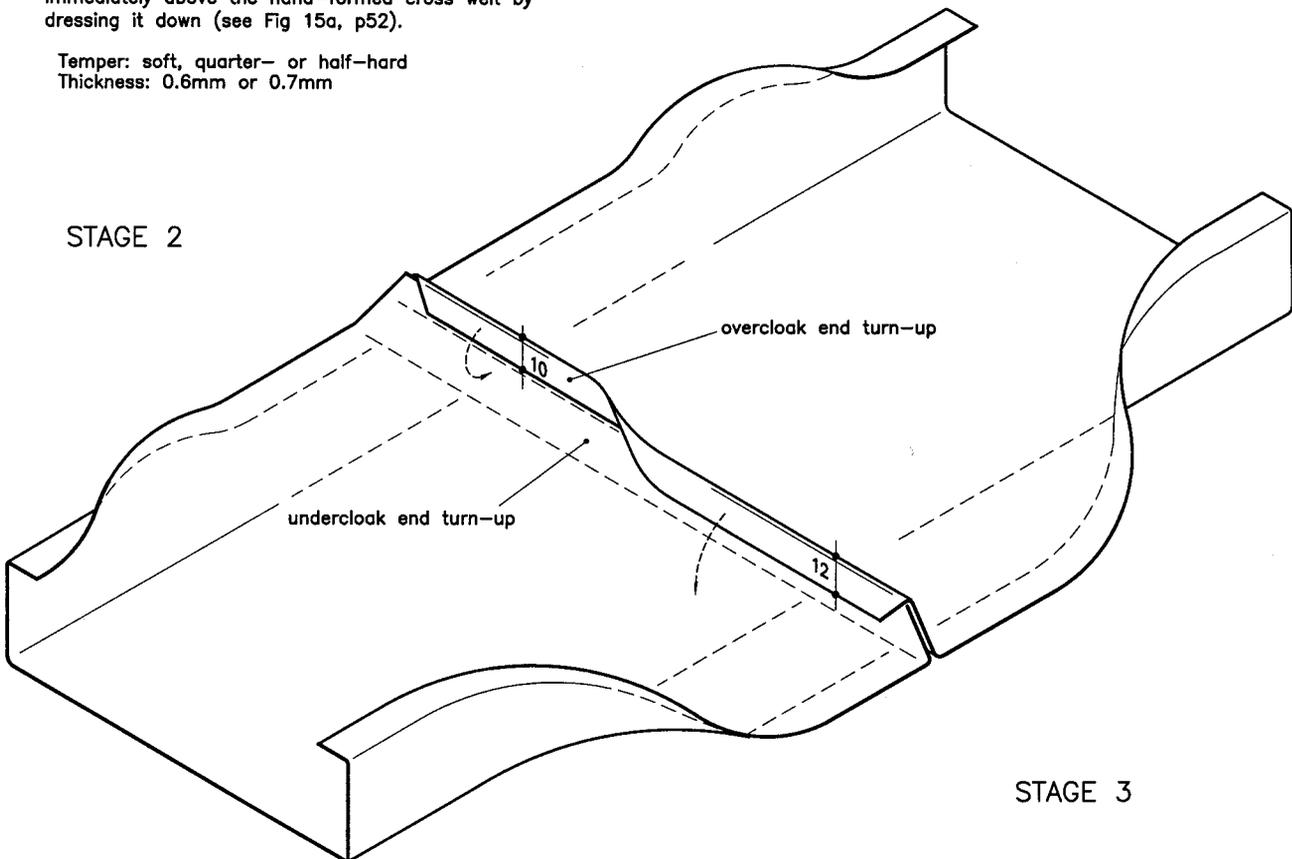
STAGE 3

Fig 46 Batten roll junction with hand-formed double-lock cross welt



* The alternative 'pre-formed cross welt' is shown in Fig 47 (p110). This method avoids the crease formed immediately above the hand-formed cross welt by dressing it down (see Fig 15a, p52).

Temper: soft, quarter- or half-hard
Thickness: 0.6mm or 0.7mm



STAGE 3

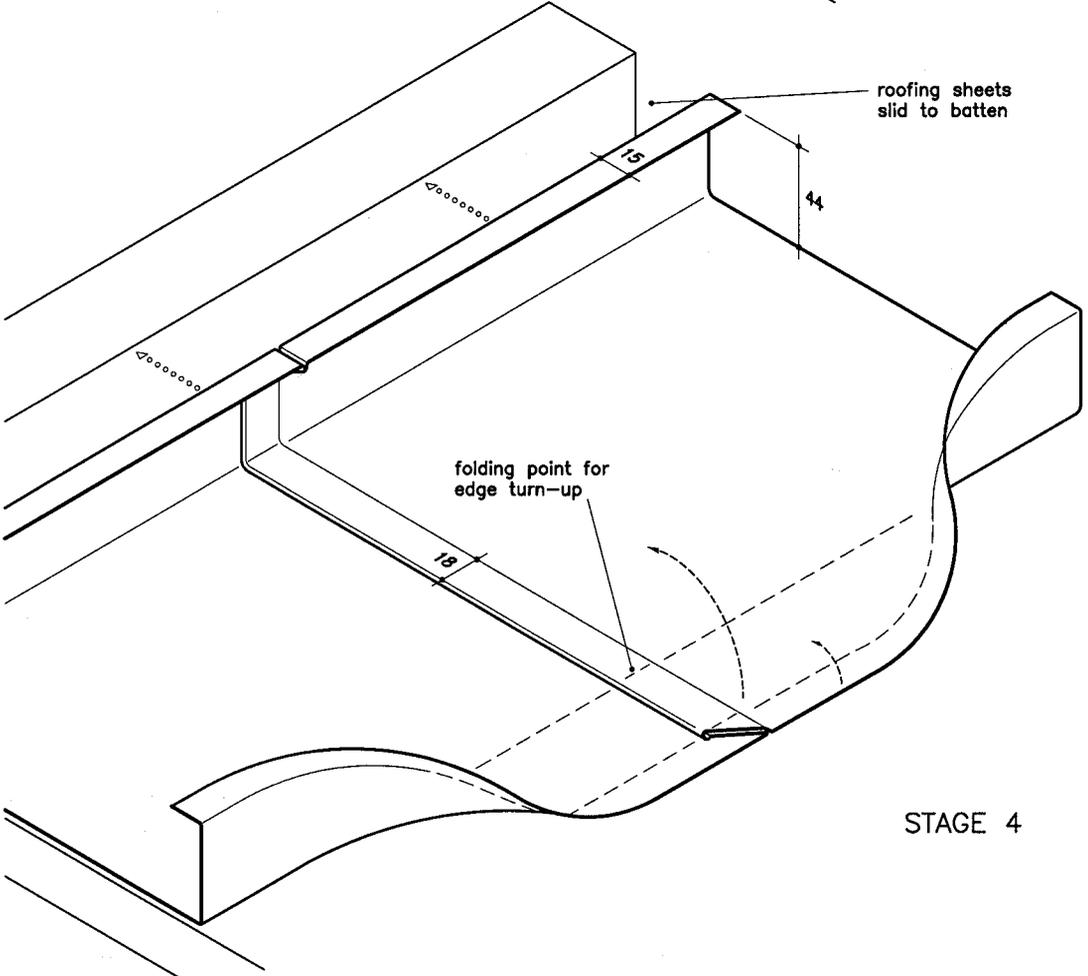
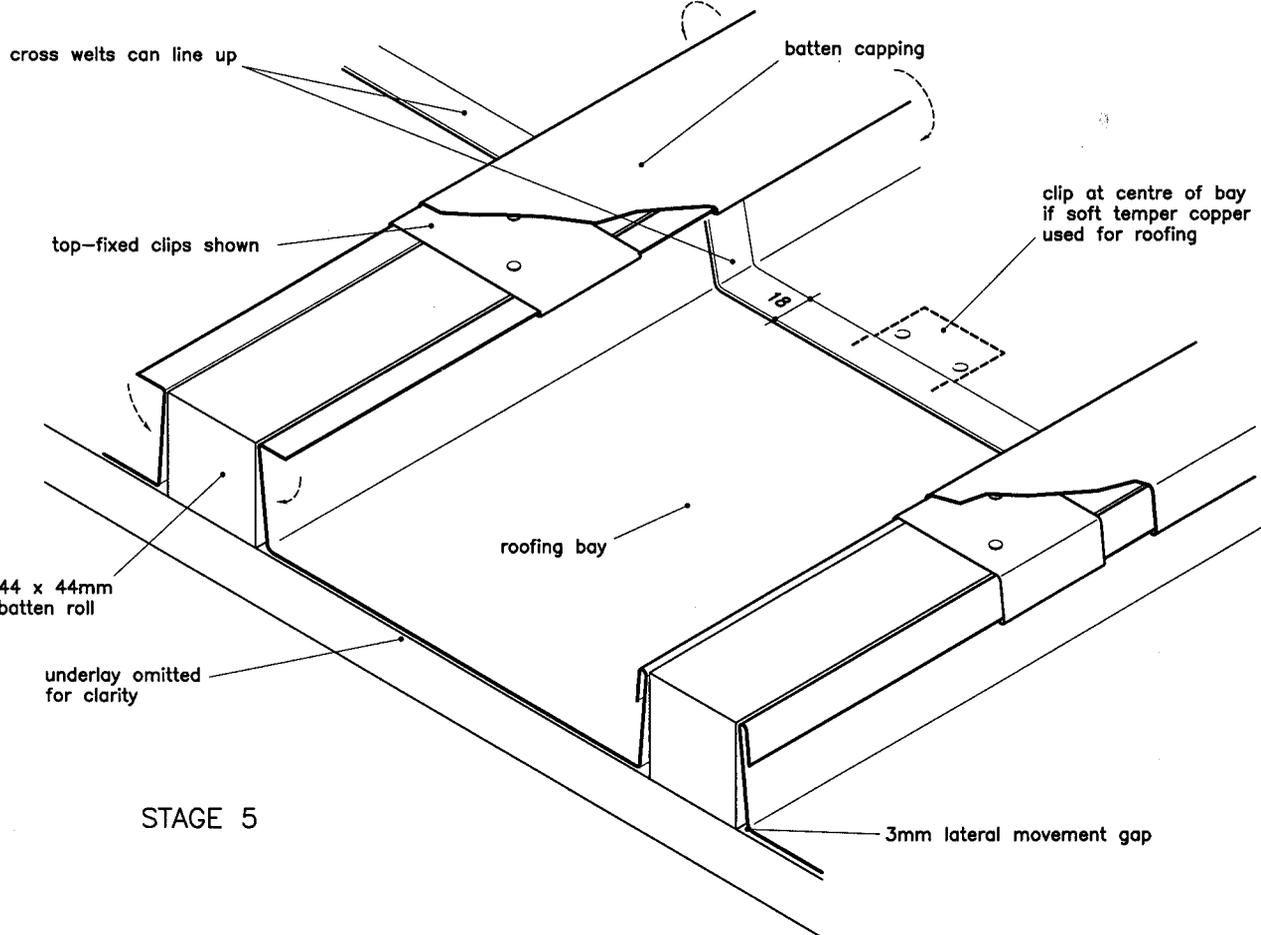
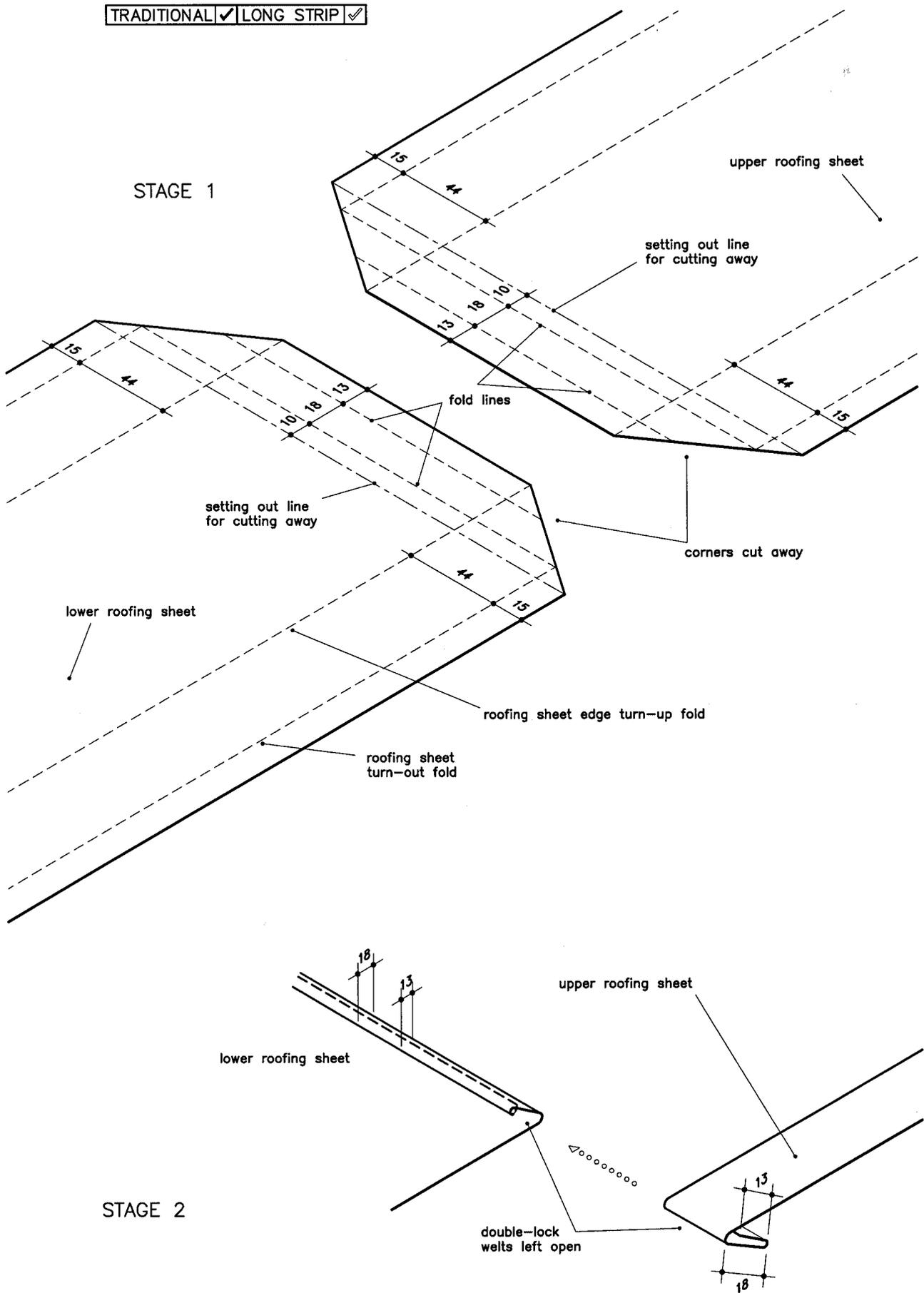
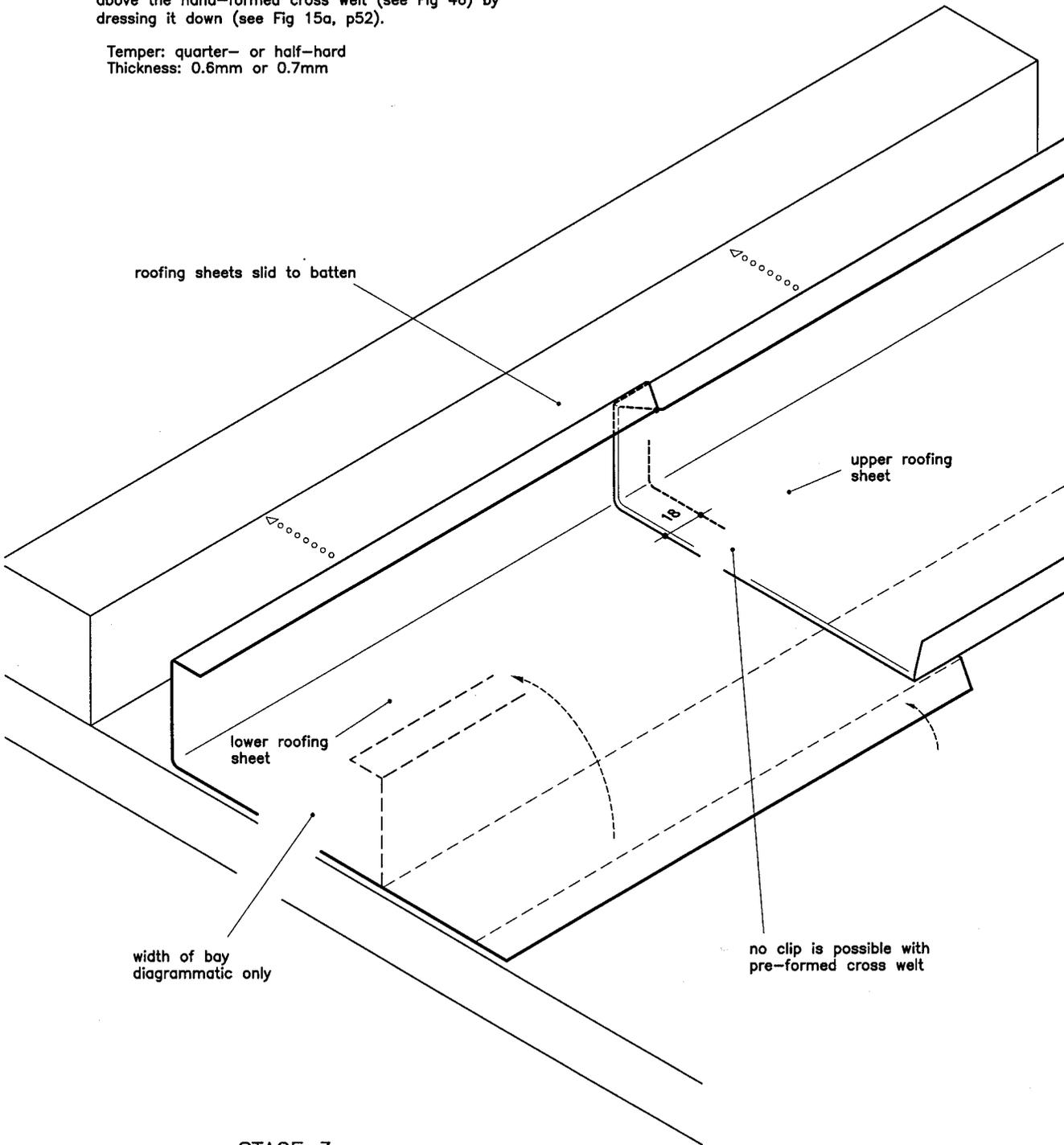


Fig 47 Batten roll junction with pre-formed double-lock cross welt



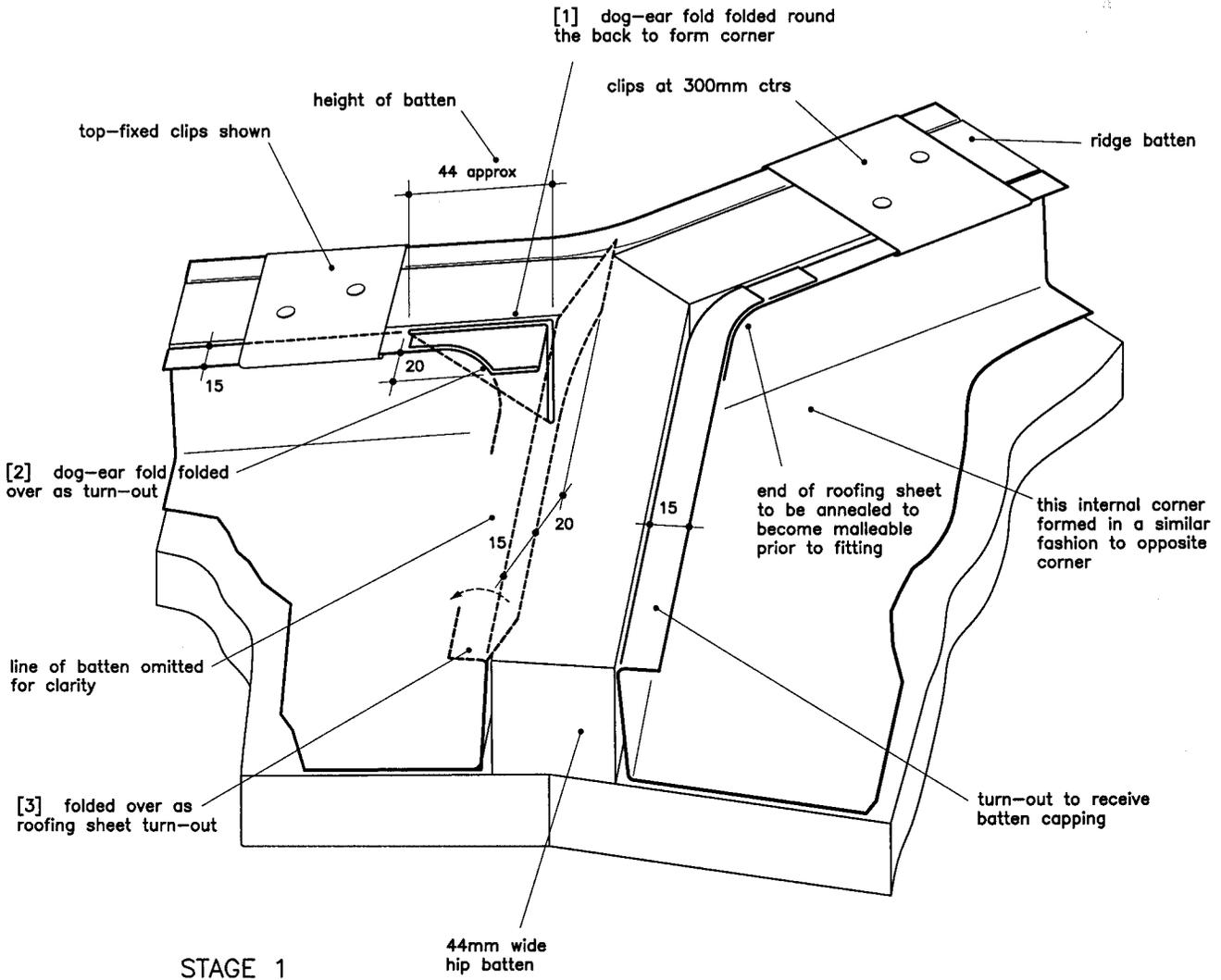
* This method avoids the crease formed immediately above the hand-formed cross welt (see Fig 46) by dressing it down (see Fig 15a, p52).

Temper: quarter- or half-hard
Thickness: 0.6mm or 0.7mm



STAGE 3

TRADITIONAL ✓ LONG STRIP ✓



* In all but the most exposed situations, the top layer of the dog-ear fold folded over in [2] can be snipped off. This reduces the number of copper thicknesses to be worked and therefore makes the job easier.

* The detail can also be used in Long Strip roofing, the only difference being the allowance for movement shown in Fig 48b opposite.

* Ridge and hip battens are often used with double-lock standing seam roofing as shown in Fig 19 (p60).

* As far as the setting out of roofing bays is concerned, both batten roll and double-lock standing seams can line up on either side of the batten ridge or hip.

* Joints in cappings are covered with Fig 23 (p64) and in Fig 12b (p48).

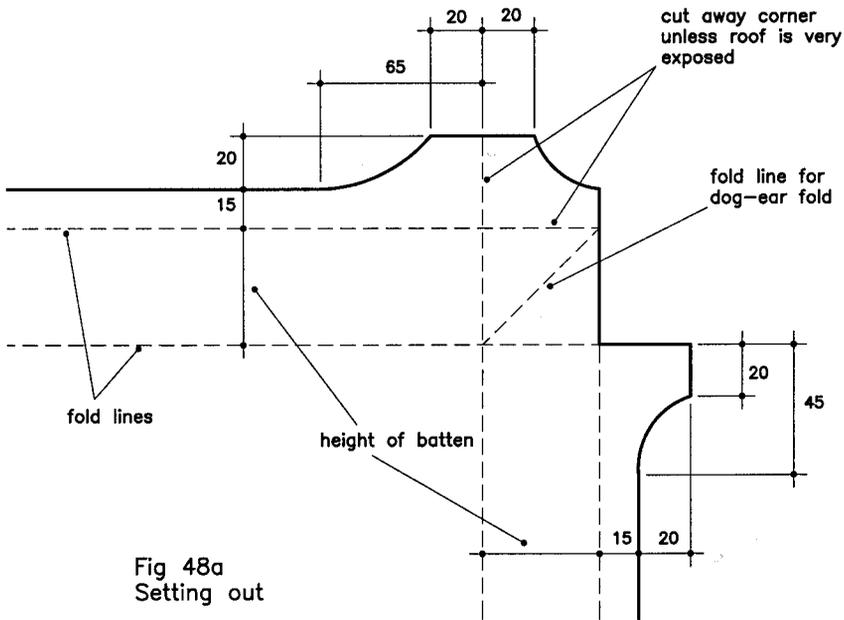
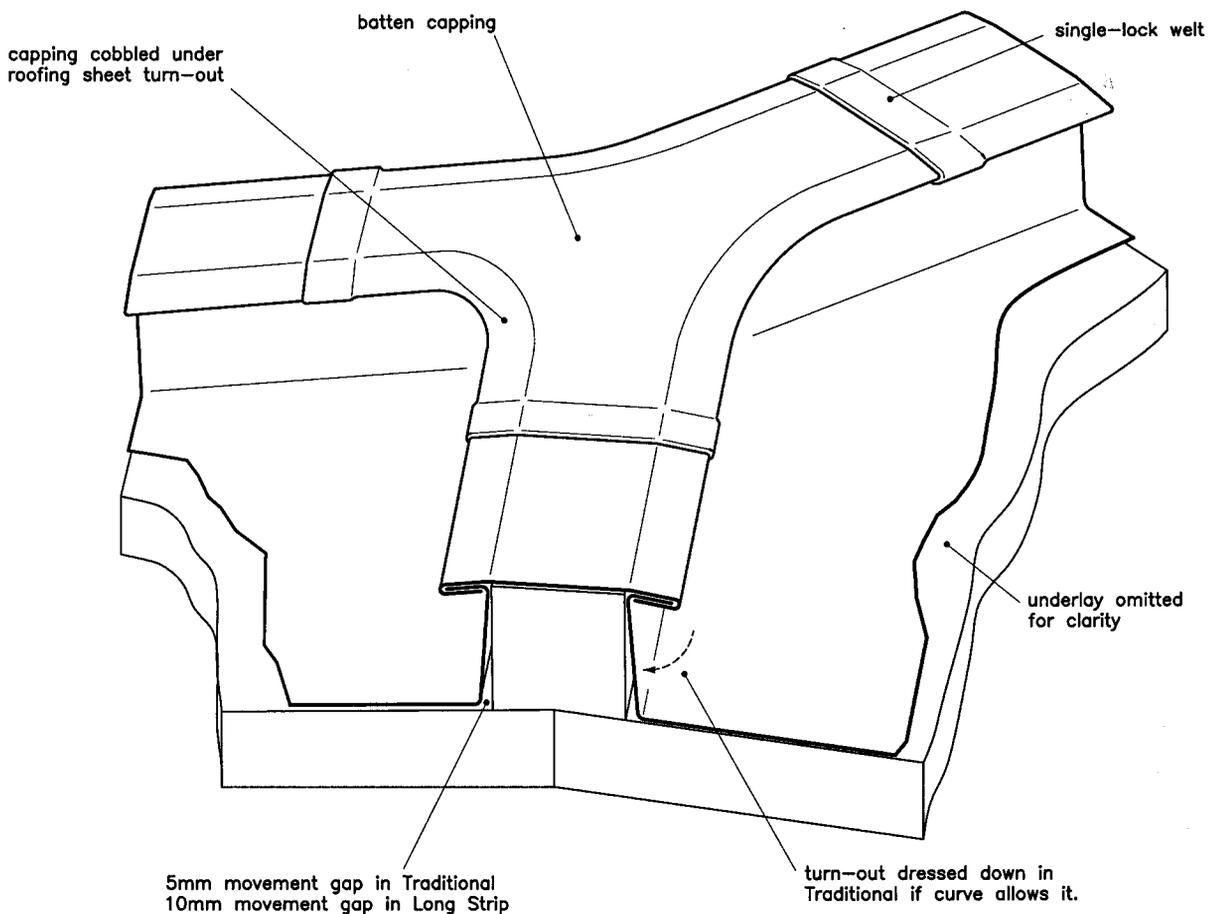


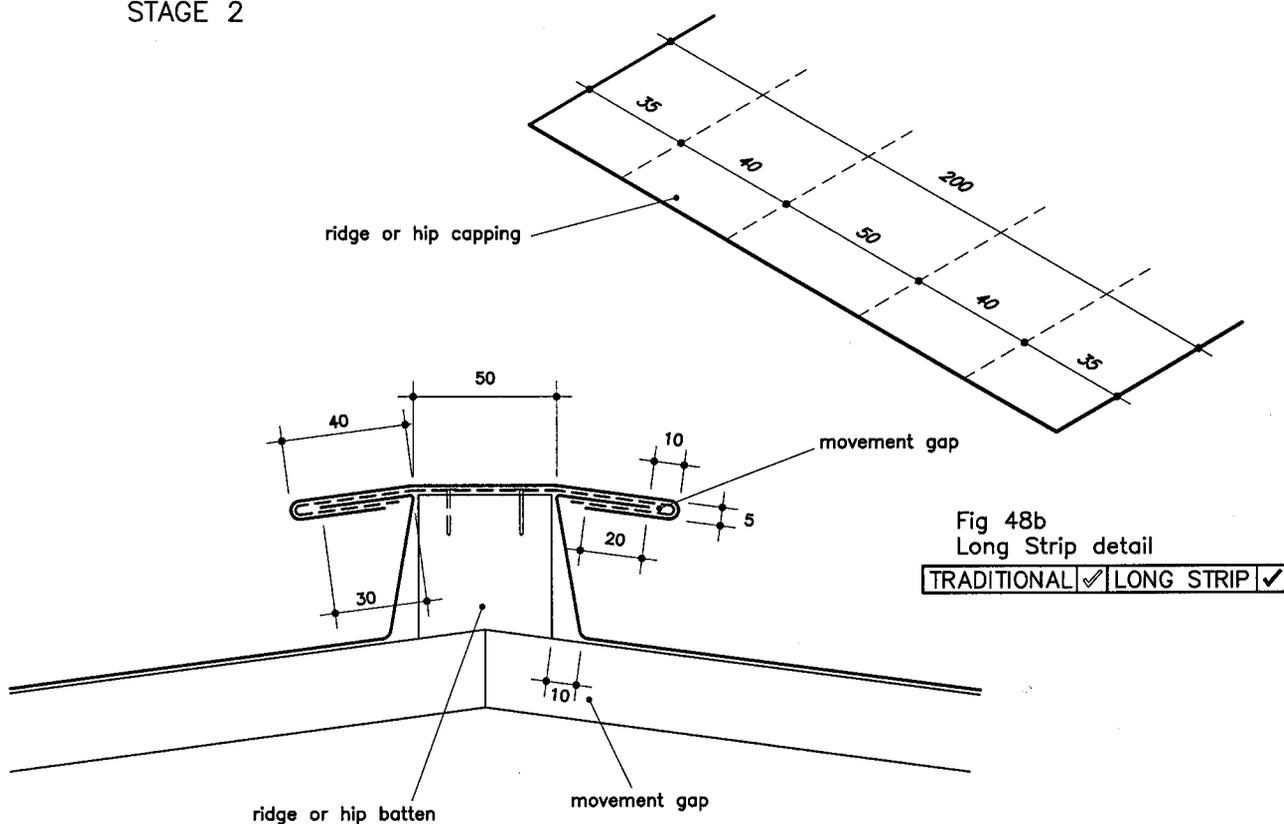
Fig 48a Setting out

Temper: soft or quarter-hard preferably. Half-hard is possible but more difficult to work neatly in this situation.

Thickness: 0.6mm or 0.7mm



STAGE 2

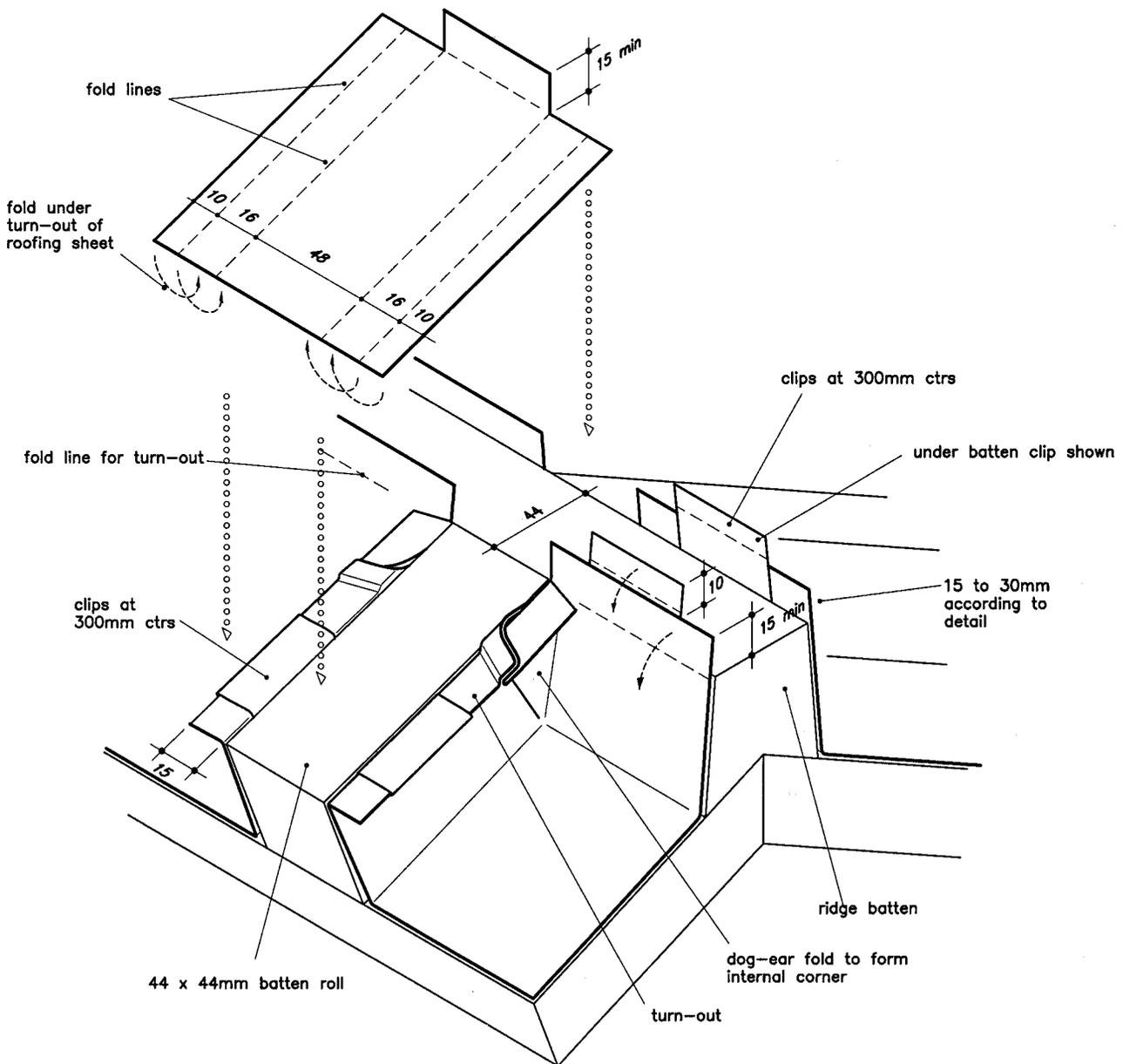


TRADITIONAL ✓ LONG STRIP ✓

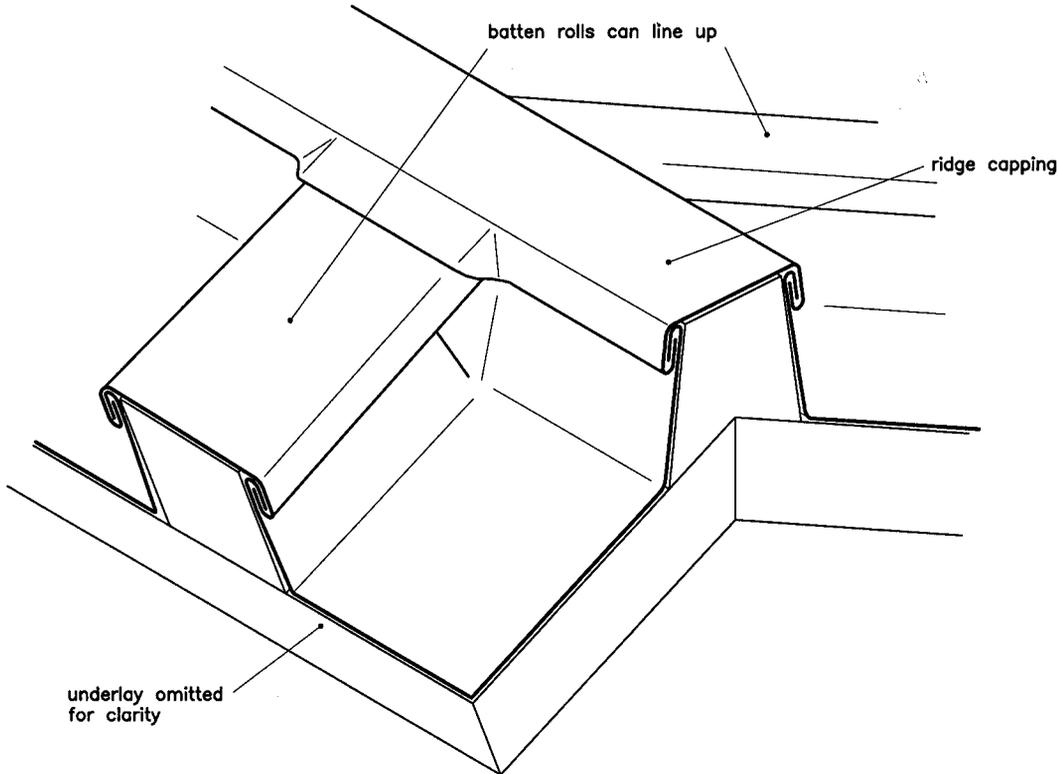
* The detail can also be used in Long Strip roofing, the only difference being the allowance for movement shown in Fig 48b (p113).
 * For forming the internal corner, see Fig 44 (p104).
 * Joints in cappings are covered with Fig 23 (p64) and in Fig 12b (p48).

Temper: soft (only in Traditional roofing), quarter- or half-hard
 Thickness: 0.6mm or 0.7mm

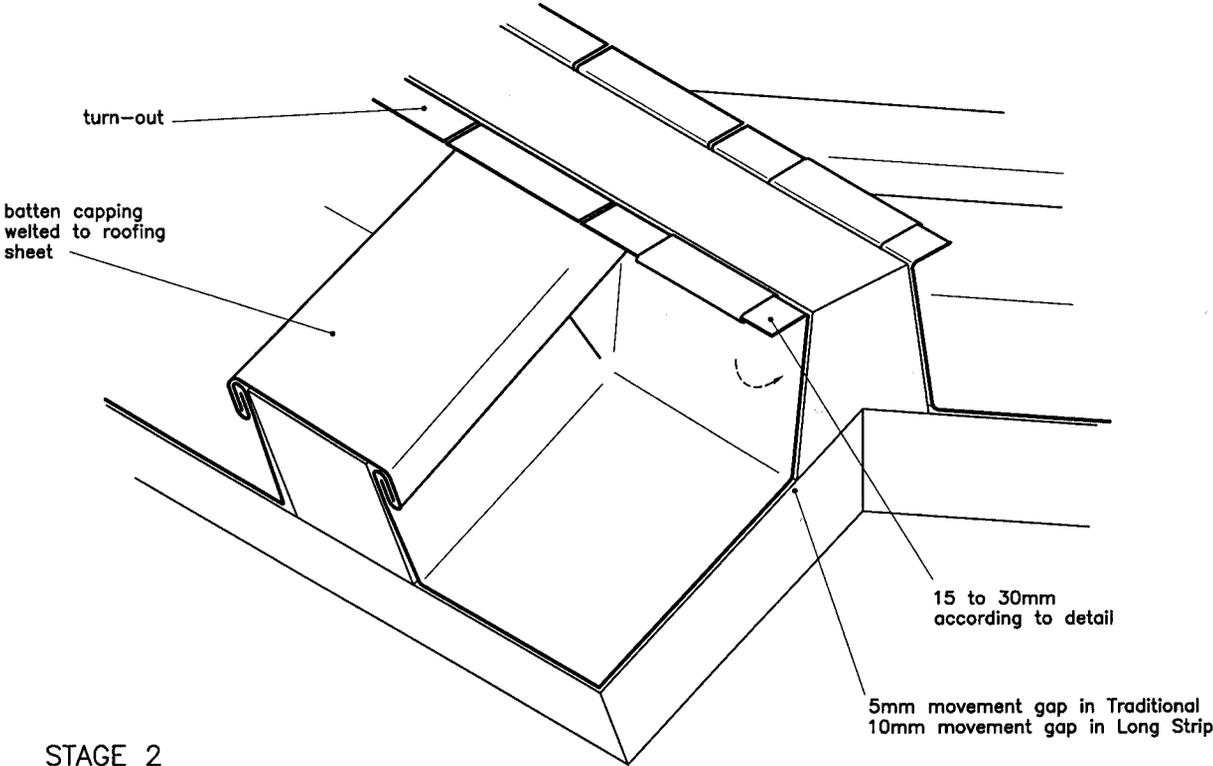
Batten capping



STAGE 1



STAGE 3



STAGE 2

TRADITIONAL ✓ LONG STRIP ✓

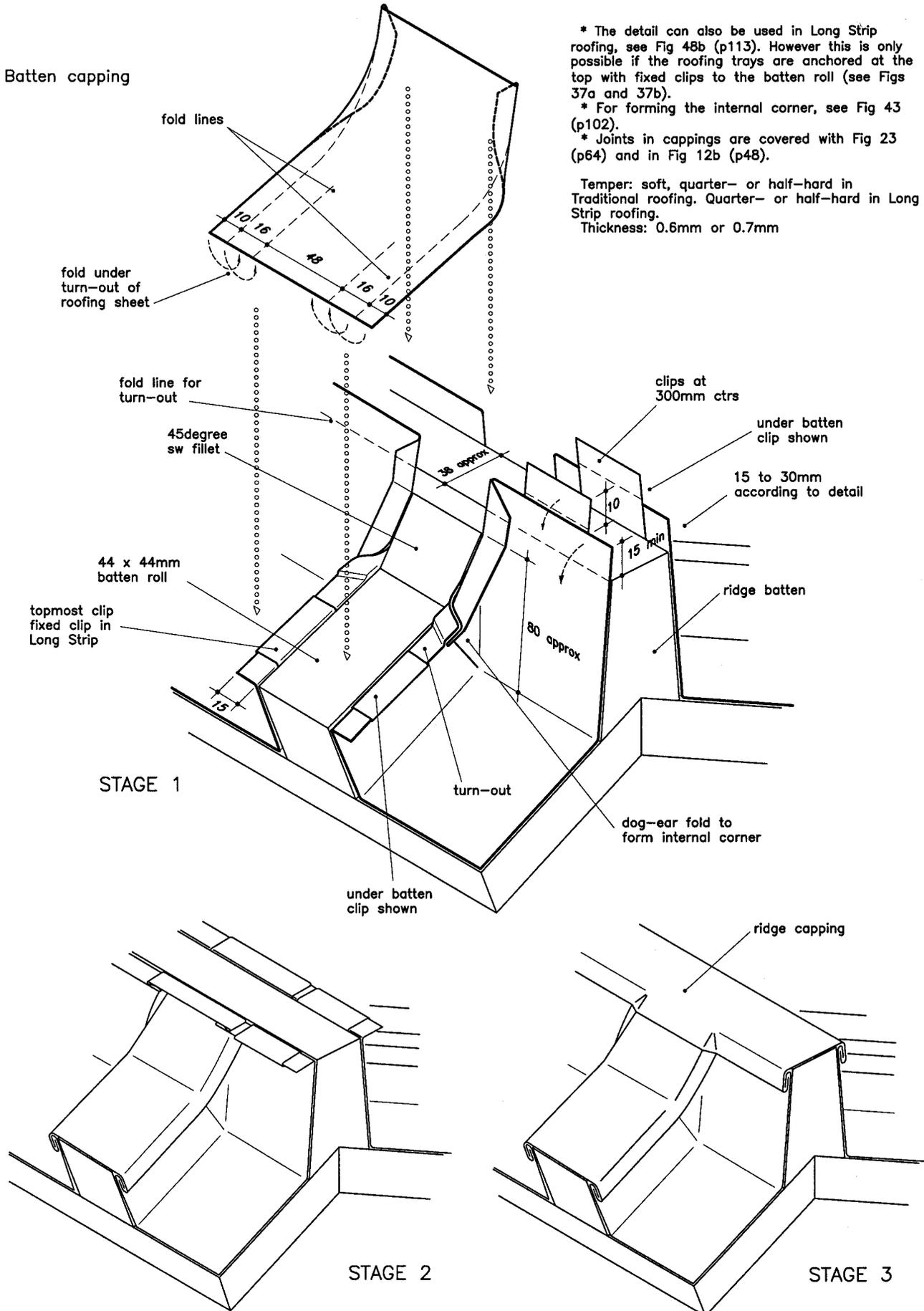
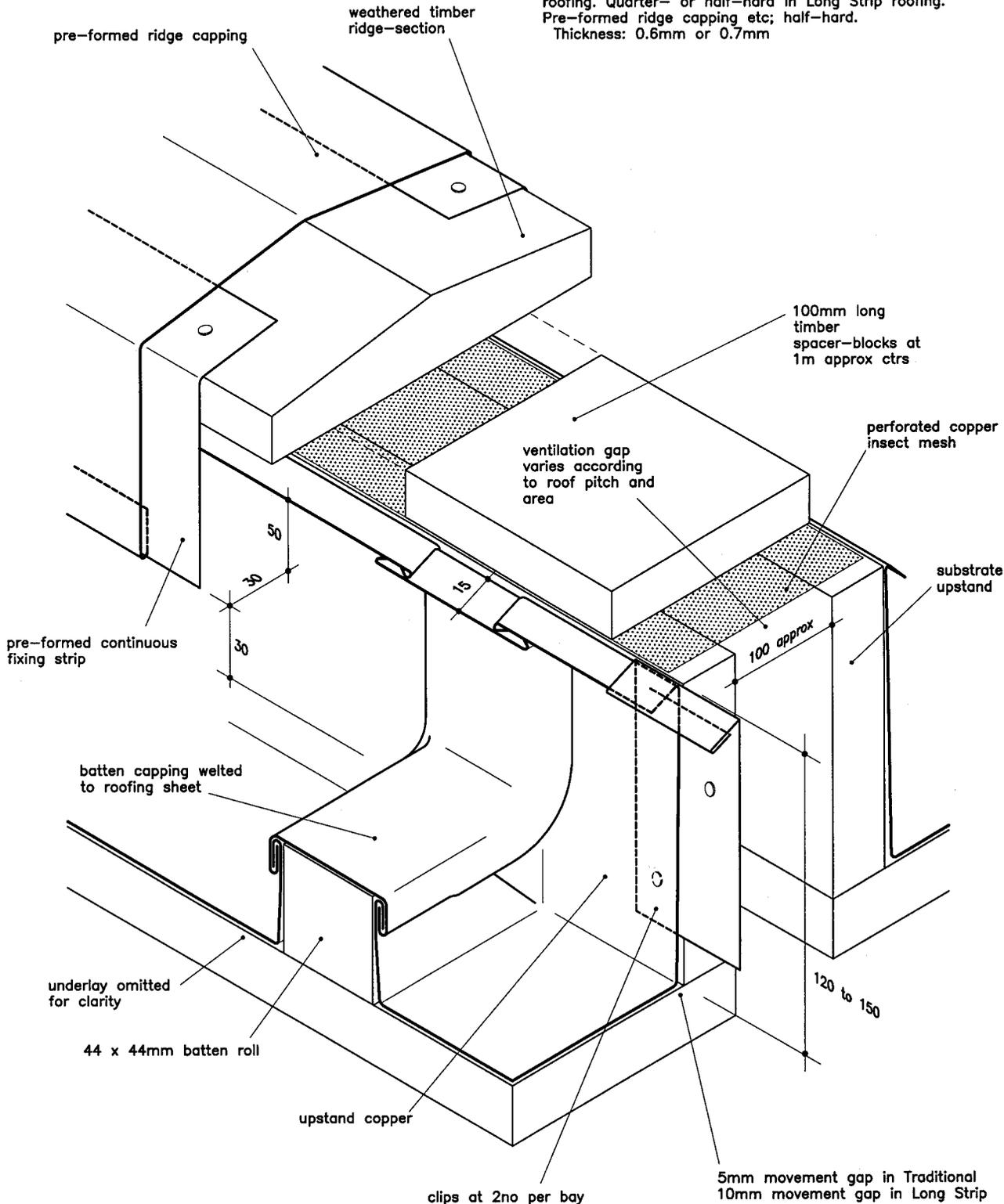


Fig 51 Ventilated ridge to batten roll

TRADITIONAL ✓ LONG STRIP ✓

- * The upstand is formed as shown in Fig. 44 (p104).
- * In sheltered situations the upstand copper can be nailed directly to the substrate upstand, instead of being clipped.
- * Joints in cappings are covered with Fig 23 (p64) and in Fig 12b (p48).
- * Joints in the continuous fixing strip are butt jointed.

Temper: soft, quarter- or half-hard in Traditional roofing. Quarter- or half-hard in Long Strip roofing. Pre-formed ridge capping etc; half-hard. Thickness: 0.6mm or 0.7mm



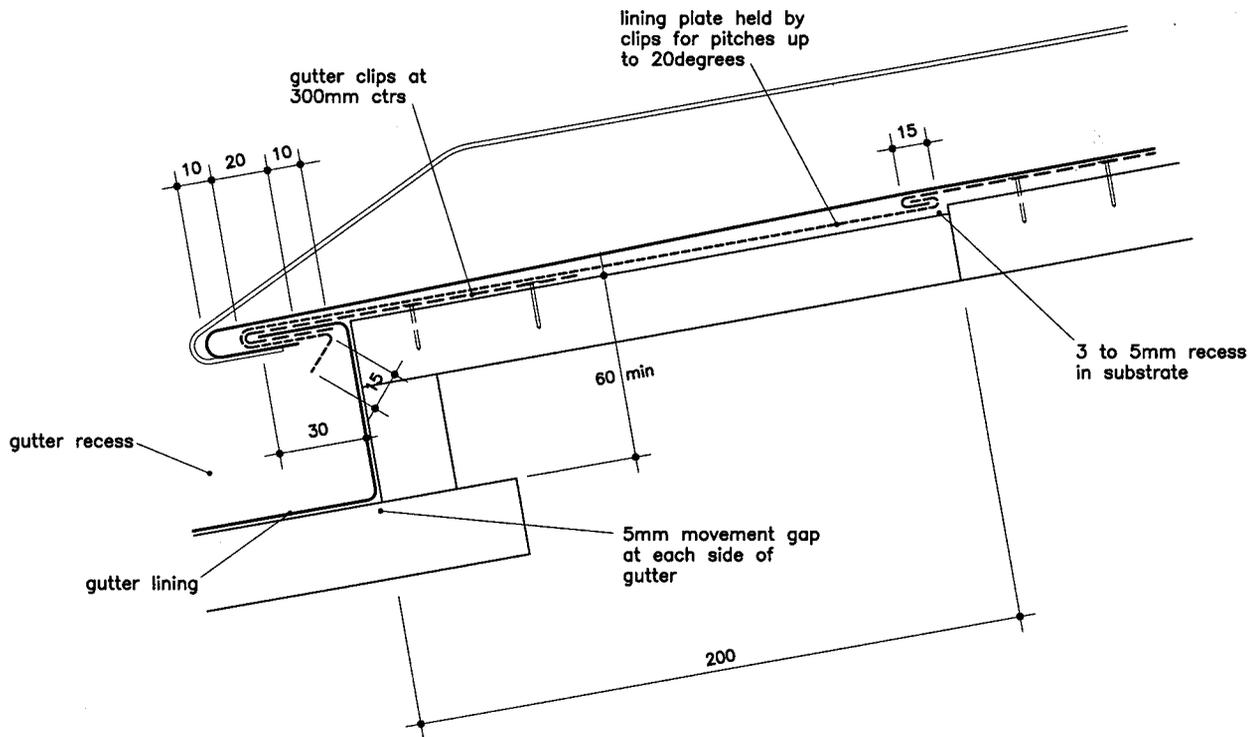


Fig 52a
Section Long Strip

TRADITIONAL LONG STRIP

* A recessed pitched valley gutter is the only option with batten rolls because forming the roll end needs a change in level. Also the use of batten roll implies low pitch roofing, and flush pitched valley gutters cannot be used at low pitches.

* Should the roof pitches draining into the pitched valley gutter be at or over 20degrees, the lining plate can be nailed directly to the substrate without a recess, as shown in Fig 41a (p96).

* The roll end is formed as shown in Fig 38 (p90), 39 (p92) or 42 (p97).

* Pitched valley gutters in general are covered with Fig 30 (p77) and Tables P and T (p13).

Temper: soft, quarter- or half-hard in Traditional roofing. Quarter- or half-hard in Long Strip roofing. Pre-formed gutter lining and lining plate; half-hard. Thickness: 0.6mm or 0.7mm

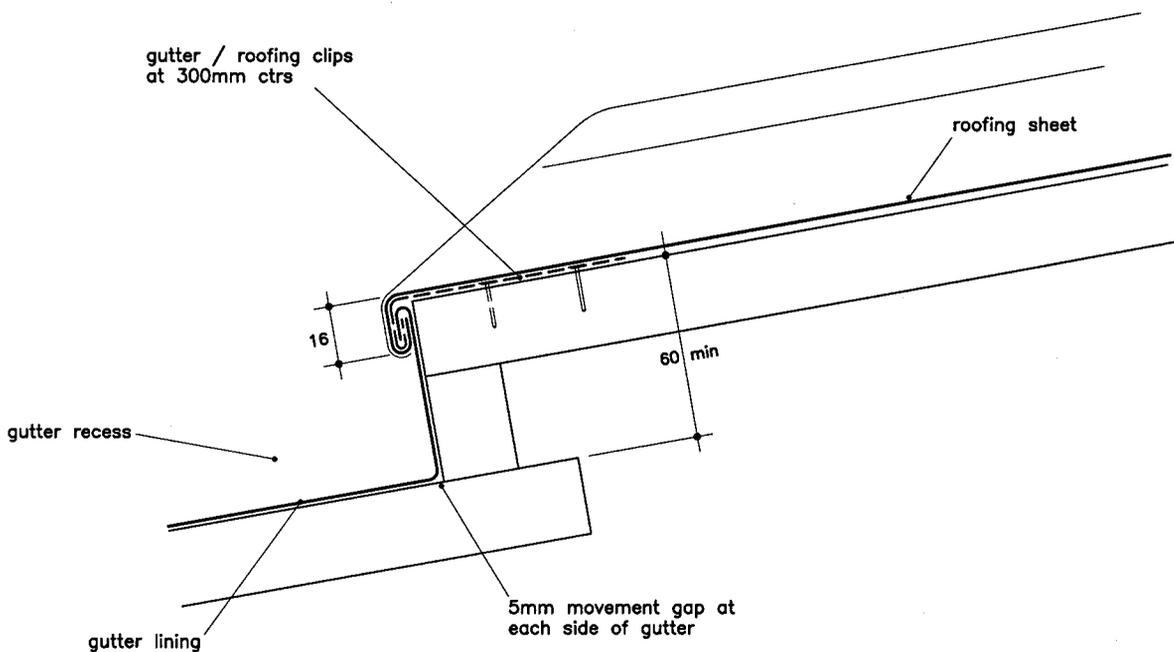


Fig 52b
Section Traditional

TRADITIONAL LONG STRIP