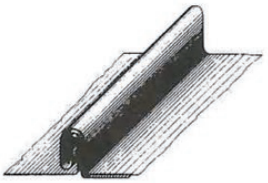
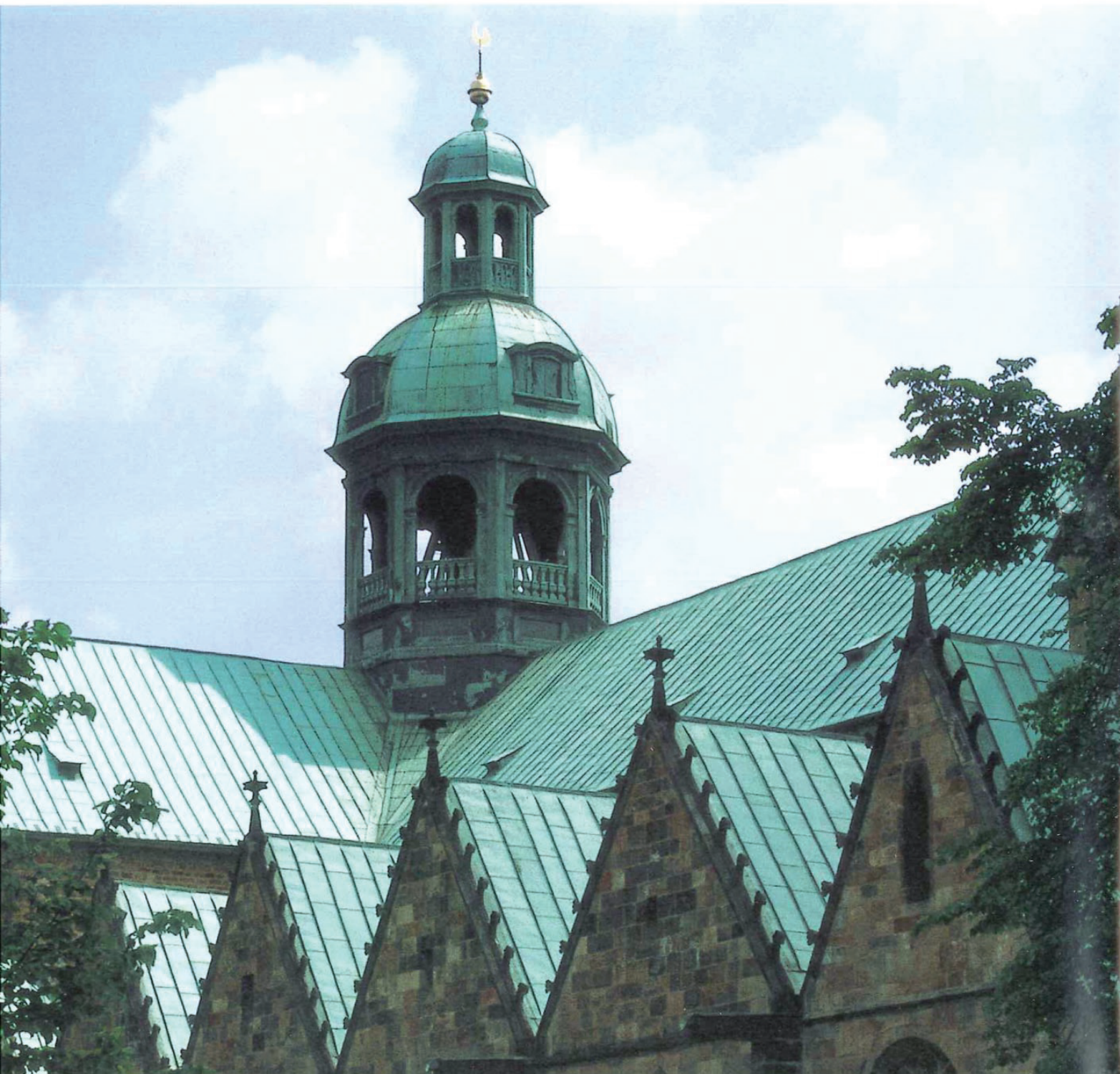
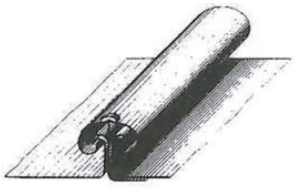
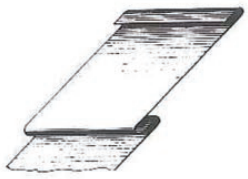




TECU® Master Seams for traditional and modern seam crafting techniques





The physical appearance of sheet metal work is determined by the seam, which connects individual sheets or trays to each other *(see illustrations)*.

In the history of construction, it is quite likely that seaming techniques are just as old as the techniques for processing copper sheets. The roof of the cathedral in Hildesheim, Germany, parts of which were built as early as 1280, displays the classic characteristics of seamed roofing *(see illustra-tions)*. The seam was so technically perfect right from its very conception – as its continued use through the centuries clearly proves – that it remains today the basis for modern applications of metalworking.

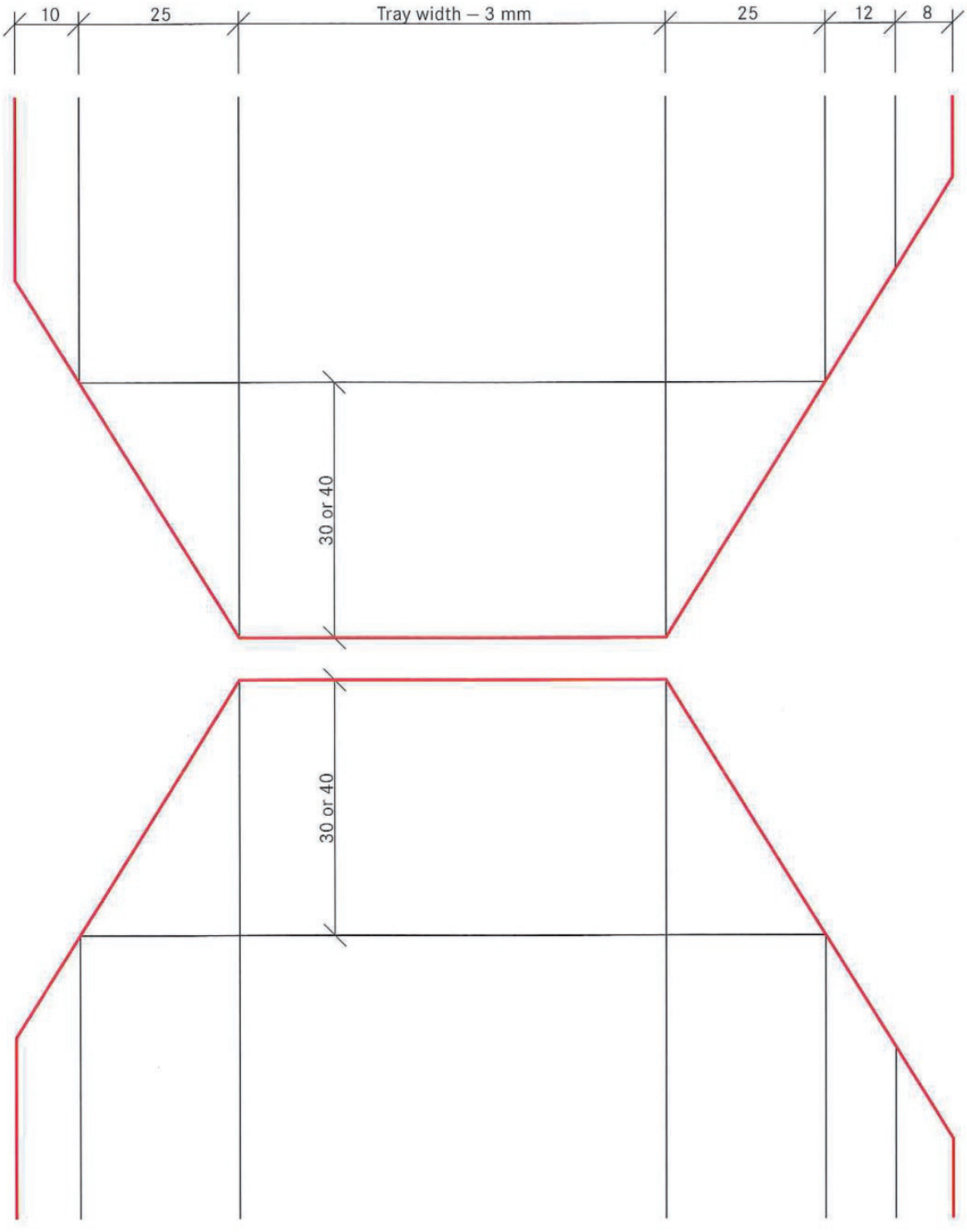
The Baroque period (especially in continental Europe) saw the introduction of a great variety of forms and can be seen as the first development of copper roofing and the copper smith's craftsmanship. Since then, numerous modifications of the original standing seam have been developed, as depicted in a trade reference book from the turn of the century *(see illustrations)*.

The seaming technique makes possible the fixing of the trays, which are pre-formed and installed in either sheets or strips. The seam itself connects the trays, which are fixed to the substrate with clips that are folded within the seam. Many design possibilities can be created from this basic technique, for example by using different constructions of the seam, varying bay sizes or bay alignments. By employing standard metalworking methods to the seams, such as crimping, stretching, folding and bending, it is possible to clad practically any building structure or shape without problem.

The following diagrams show the most common seam ends. The individual working steps and cutting away for seam ends are illustrated with models. The master seams are displayed on a scale of 1:1 and may be copied, cut out and transferred to copper sheets. Paper sheets may also be used in place of metal to practice forming the master seams. Not all the steps of some seam connections can be displayed with paper since it cannot be splayed like metal sheets.

Single lock cross welt, roof pitch ≥ 25°
made of TECU® copper

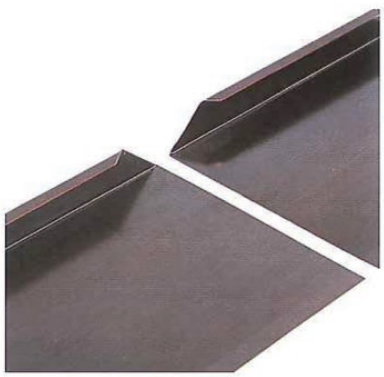
Scale 1:1



Single Lock Cross Welt, Roof Pitch ≥ 25°

The lateral joints necessary for sheet (traditional) cladding are formed as a single lock cross welt for roof pitches of 25° (47 %) and over. To prevent pooling water from penetrating the single lock cross welt, either a 40 mm forward or backward fold is added at the tray end. The trays are then seamed together with an overlap of 10 mm in the finished seam.

1

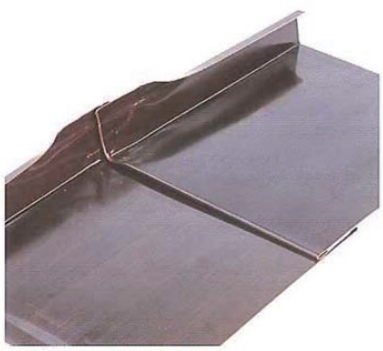


Prepare the tray ends and cut away the corners.

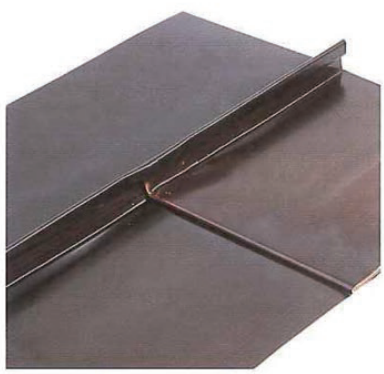
2

Flatten the standing seam ends; fold the upper tray back and the lower tray forward by 180°.

3



With an overlap of 10 mm, hook the tray ends together and erect the standing seam.

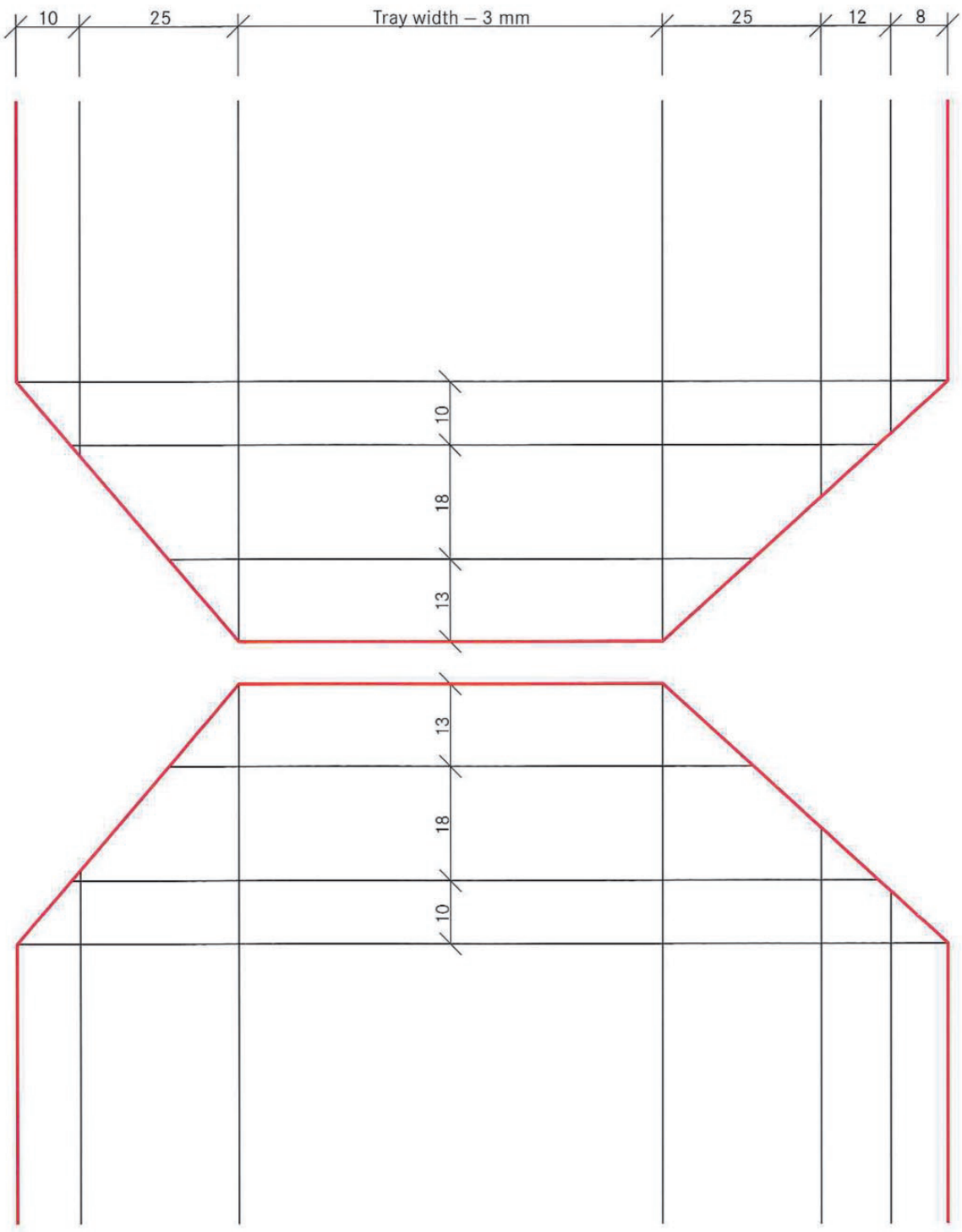


4

Fold the standing seam into a double or angled welt.

Double lock cross welt, roof pitch ≥ 7°
made of TECU® copper

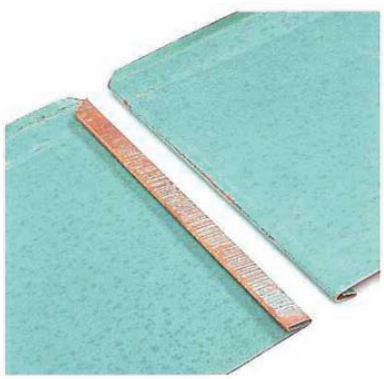
Scale 1:1



Double Lock Cross Welt, Roof Pitch ≥ 7°

A double lock cross welt is necessary for roof pitches between 7° (13 %) and 10° (18 %). For roof pitches under 7° (13 %), a waterproof joint must be formed either by soldering, welding, riveting together with a sealing insert, or welting with a seal in the welt.

1



Prepare the tray ends according to the drawing and, using a 3 x 15 mm straight edge, fold ends 180° at 13 and 18 mm.

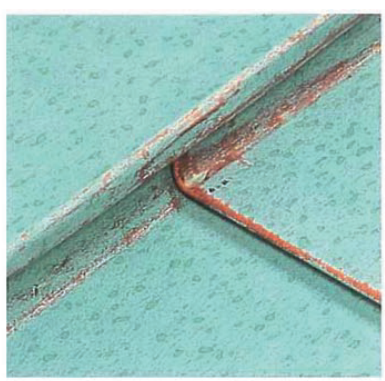
2

Pull the straight edge out and prepare the second tray end in the same fashion. Slide the tray ends sideways into each other.

3

Use the seaming iron to erect the standing seam.

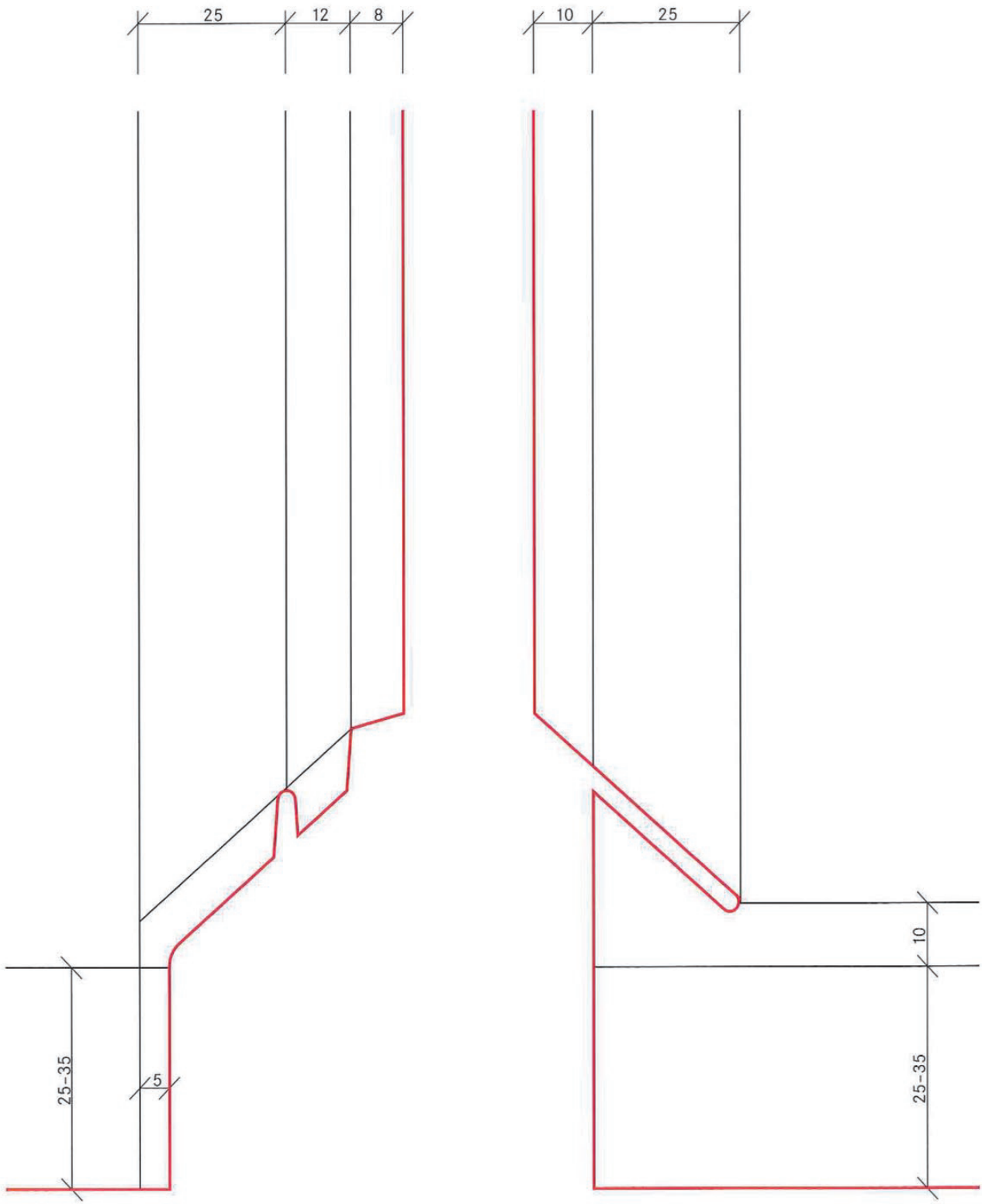
4



Connect the standing seam to the tray parallel to it.

Splayed edge standing seam made of TECU® copper

Scale 1:1

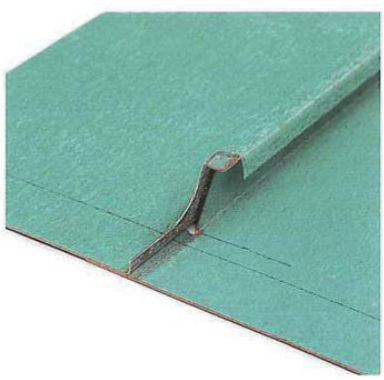


Splayed Edge Standing Seam

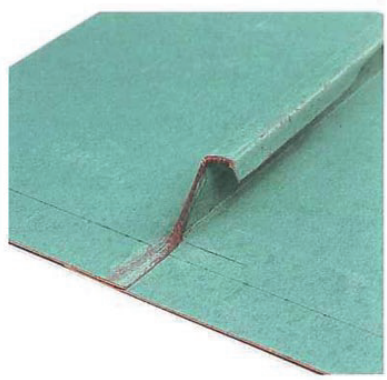
This popular filigree seam connection is most often used for the eaves of a roof.

Eaves constructions should generally be carried out with a standing seam. Flattening the seam and carrying it around the edge of the eaves would obstruct expansion across the trays. The bead on the eaves sheet should not exceed 25 mm in order to accommodate for expansion down the bays. It should be carried out with the help of a spacer, keeping at least 10 mm between the eaves sheet and the bead.

1



After the trays have been scribed, they are cut to size and folded.



2

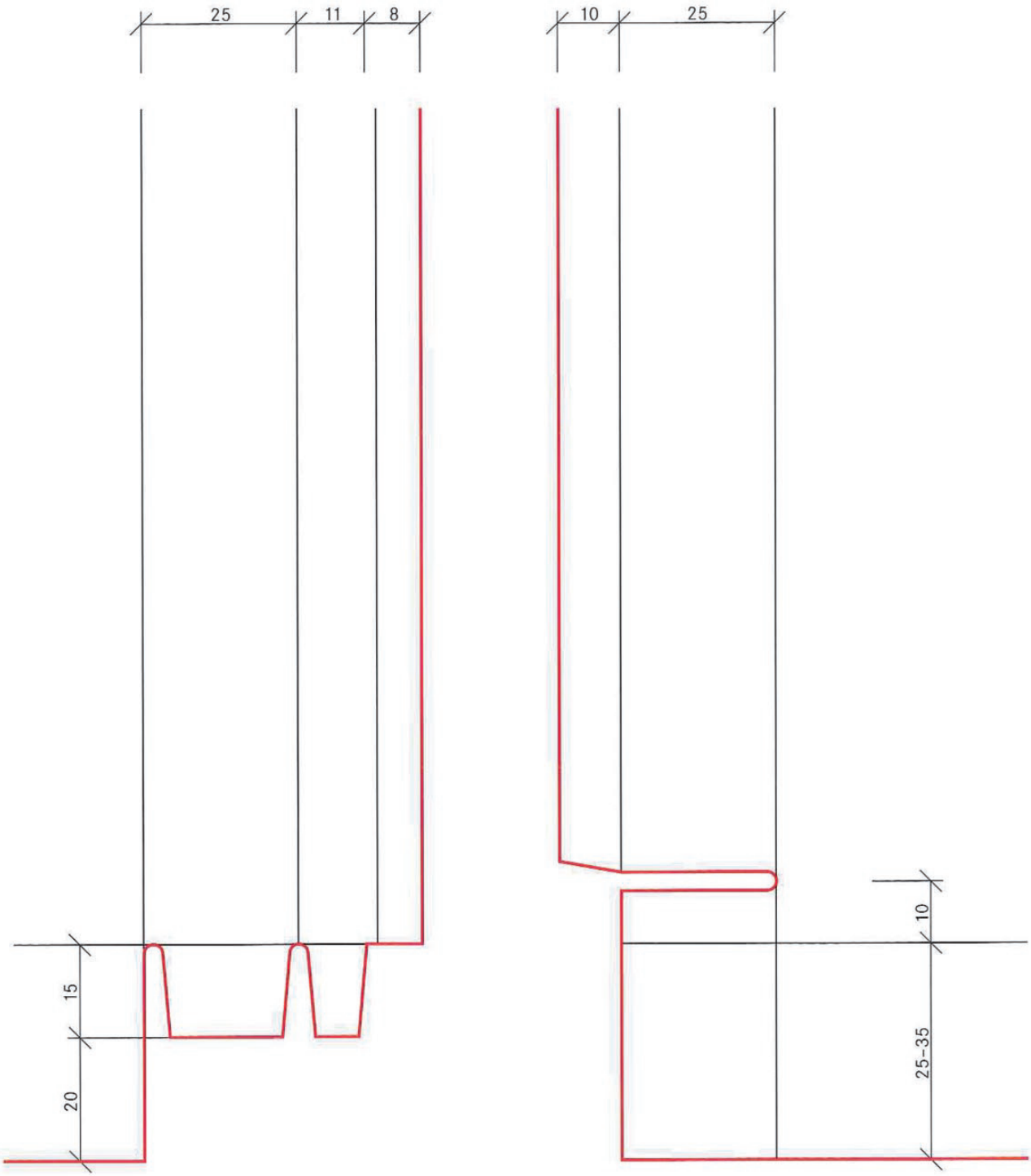
At the head end of the seam, 8–10 mm of the bead are flattened.

3

The edge of the eaves is ed under the eaves sheet using an eaves folder (first turn) and an eaves closer (second turn).

Squared edge standing seam made of TECU® copper

Scale 1:1

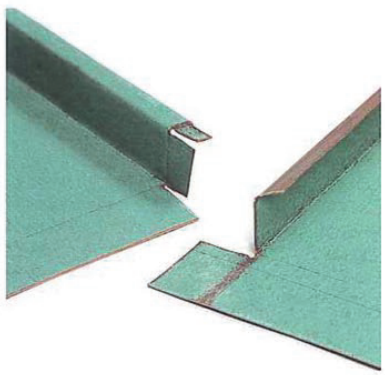


Squared Edge Standing Seam

The squared edge standing seam type is often chosen for the ends of facade cladding and for very low pitched roofs. The foot end of the seam is „open" to prevent rainwater run-off from being drawn in.

1

The standing double seam should be cut away at the intersection of the trays so that only the seam upstands of the overlapped tray are approx. 20 mm longer.

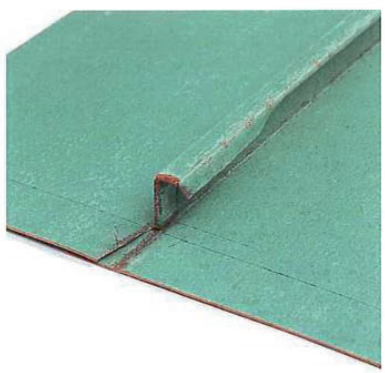


2

Slide the trays into each other.

3

The 20 mm longer strip is then wrapped around the open end of the standing seam.

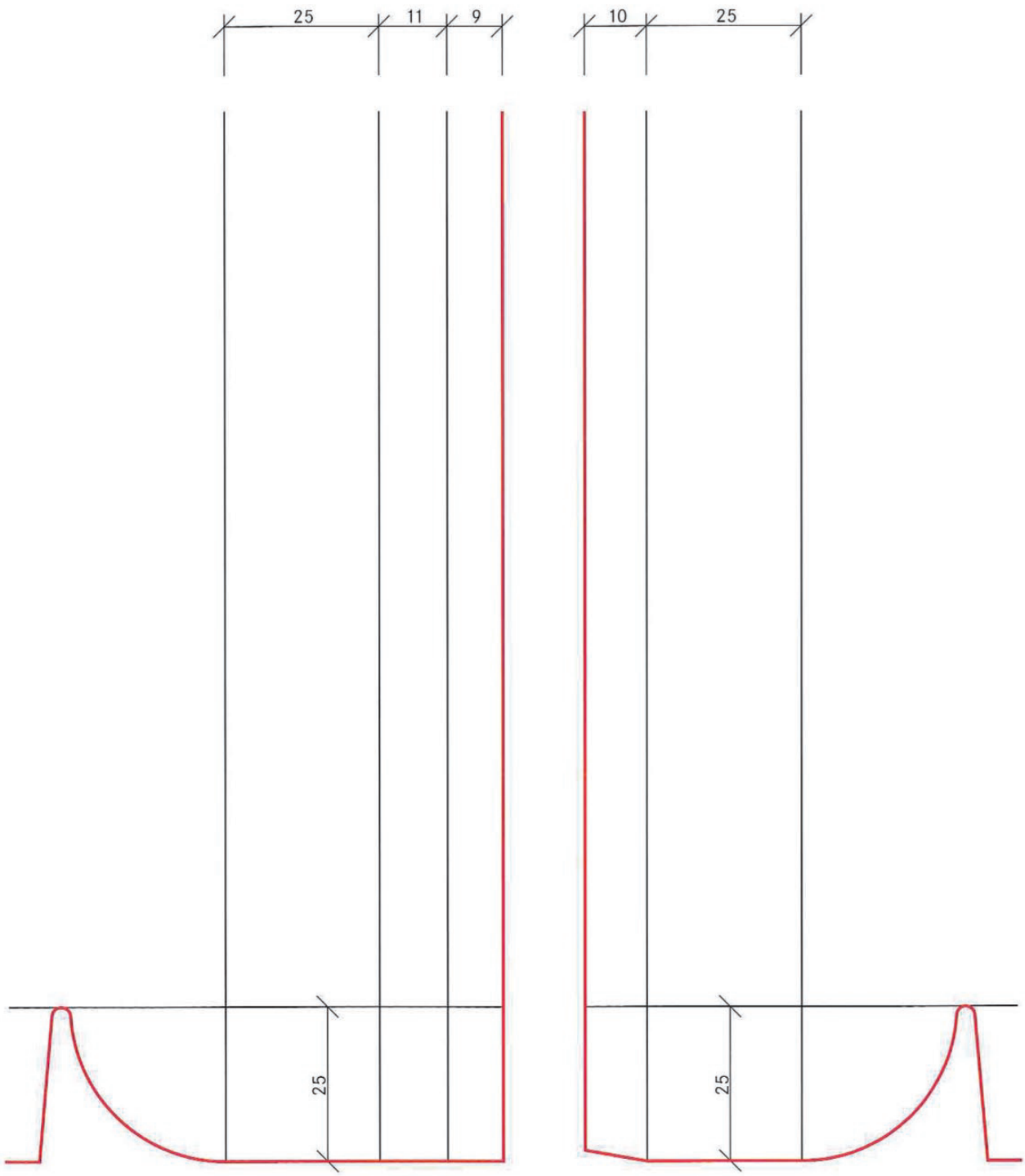


4

The end piece of the overlapping seam is folded back in and welted together with the tray end around the eaves flashing.

Swabian Eaves
made of TECU® copper

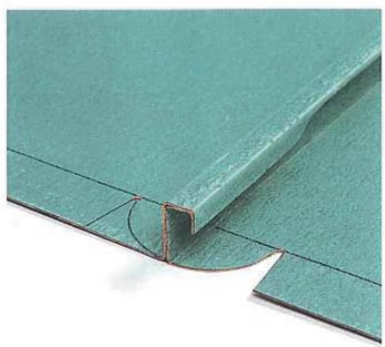
Scale 1:1



Swabian Eaves

The standing seam is the most economical and most technically sound way of preventing capillary water from being drawn in. Swabian eaves, however, are not recommended for the ends of facade cladding because the sides of the projecting „nose“ are too easily damaged.

1



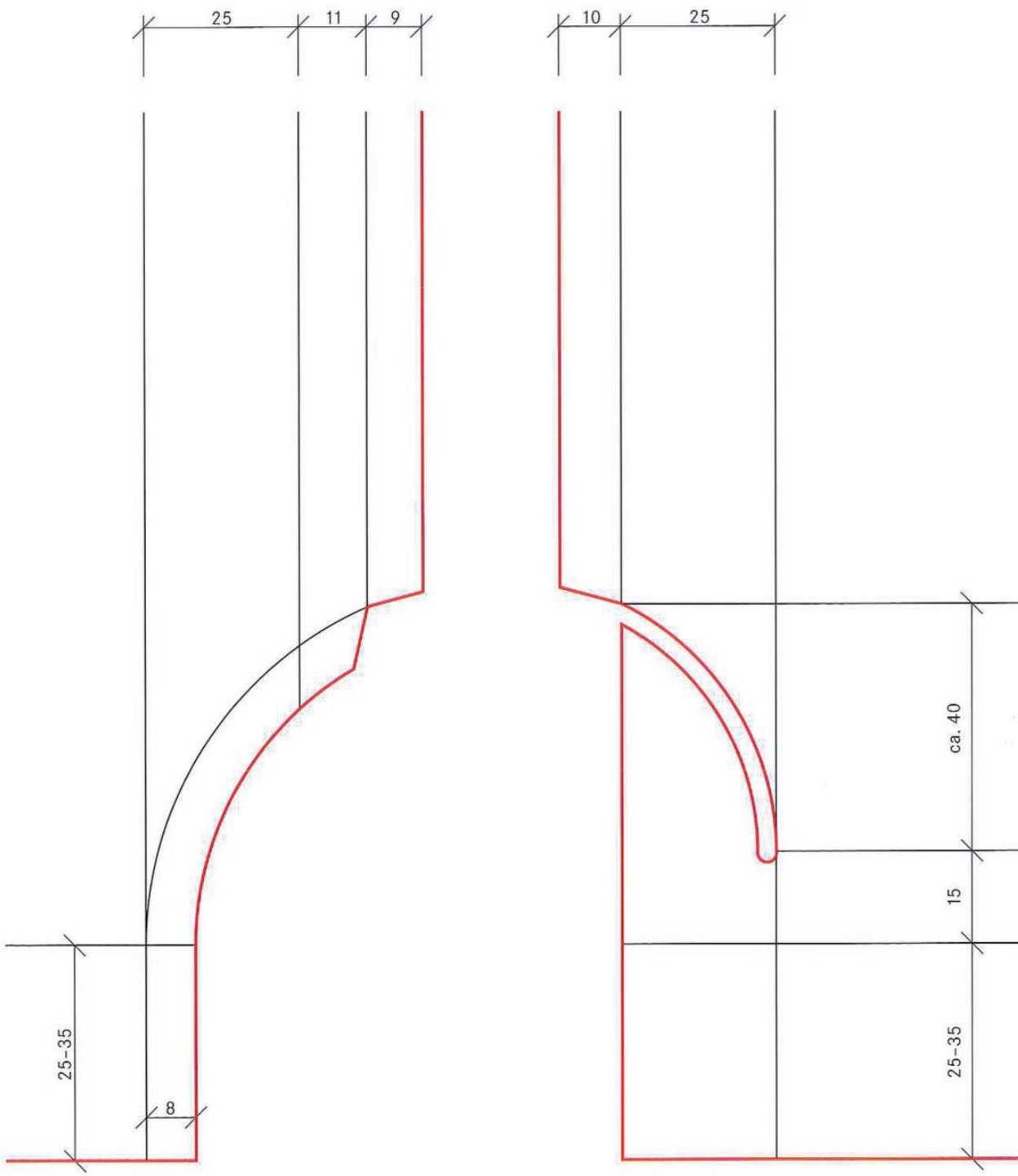
At the end of the standing seam, a quarter circle with a radius of approx. 25 mm is cut in the tray.

2

The double standing seam is formed and the end of the tray is folded around the eaves. The protruding quarter circle is folded down or crimped to create a smooth edge.

Curved eaves standing seam made of TECU® copper

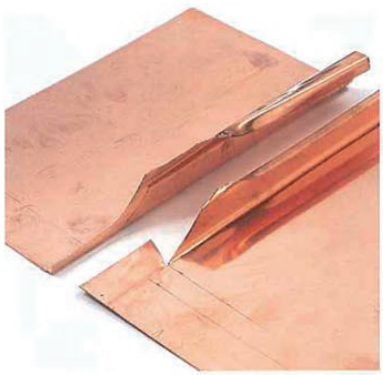
Scale 1:1



Curved Eaves Standing Seam

The curved eaves standing seam is a very attractive technique that is especially effective for facade cladding. The seam can be produced either by hand or machine.

1

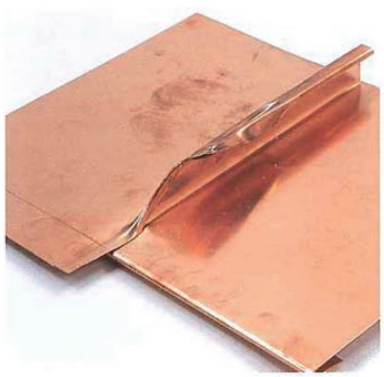


Before folding or profiling, the master pattern should be transferred to the sheet and cut out. Next, the top and bottom are slit approx. 5–8 cm.

2

The angled seam is closed just before the seam is set upright.

3



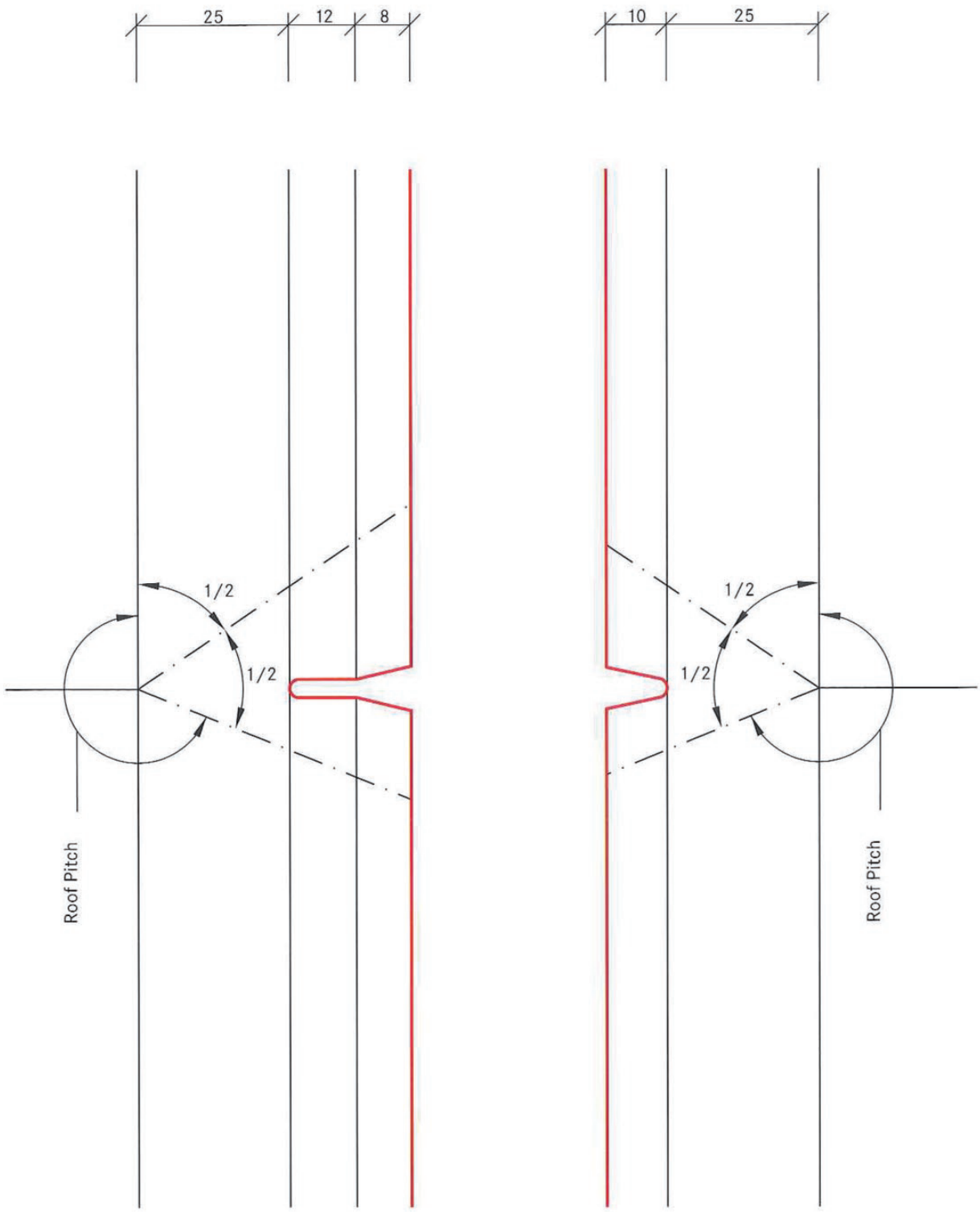
Curve and press the 8–10 mm eaves flashing closed.

4

Double welt the standing seam and fold the eaves bead around the sheet.

Pinched seam
made of TECU® copper

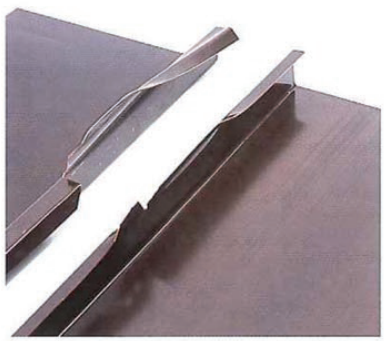
Scale 1:1



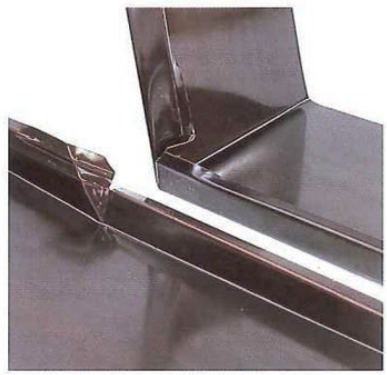
Pinched Seam

In contrast to a semi-circular seam end, this connection does not require an extension of the seam. A cut is necessary on the lateral fold line in order to ensure that the seam is sealed only up to the finished standing seam height. The wall upstand is 150 mm. The notches, 8 mm on the bottom seam and 20 mm on the top seam, should be pre-perforated 2–4 mm so that the material does not tear after the notches have been made. The width of the cut out piece is equal to the diameter of the perforation. The pinched seam construction is depicted in the drawings below.

1



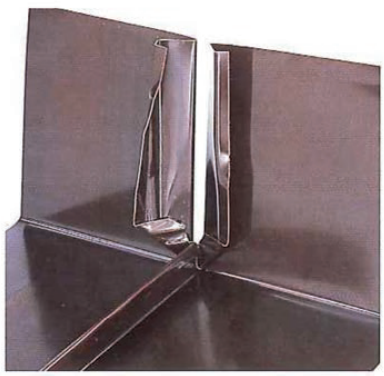
The seams are notched on the fold line and set upright. The pattern for the fold lines is to be aligned laterally and transferred onto the sheet.



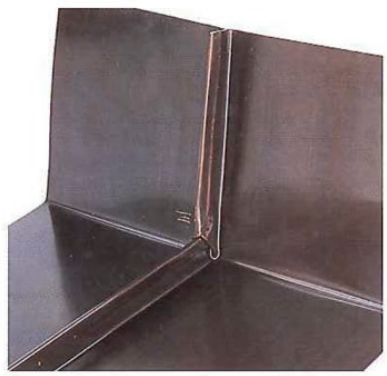
2

The seams are pulled inward toward the roof along the fold lines with dog earring pliers or corner turning tongs. Then the abutment is erected on the fold line.

3



The seam on the abutment is bent back left and right against the wall and the bottom double standing seam is welted.

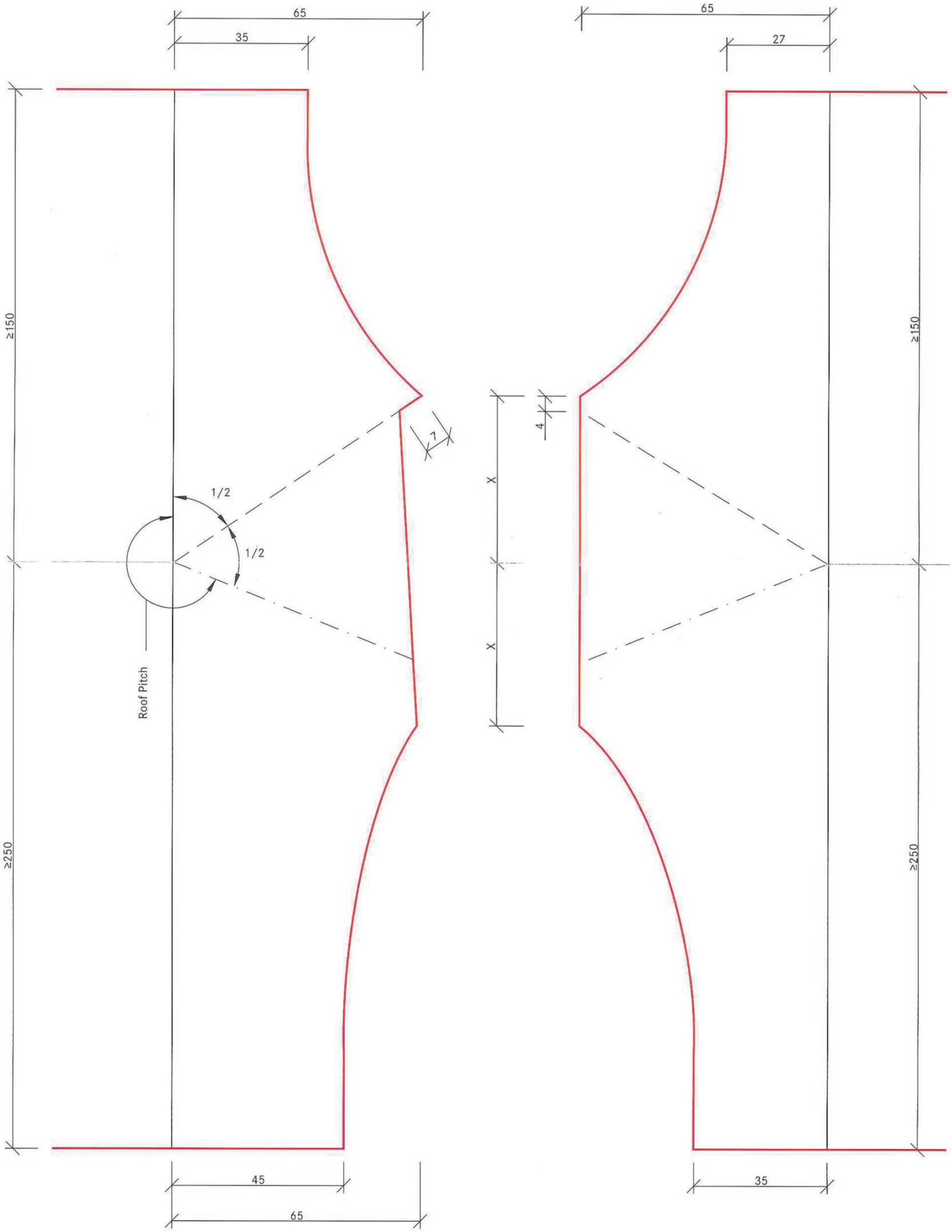


4

The abutment seam is repositioned and double-seamed. Be sure that the lower section of the pinched seam is not fitted tightly so that the so-called „eye" is formed.

Sweep
made of TECU® copper

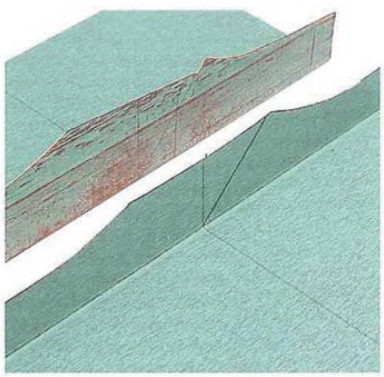
Scale 1:1



Sweep

The sweeping pinched seam has a very elegant appearance which requires practice and good craftsmanship to produce. It is the perfect construction for roofs with low pitches as well as for flashings around chimneys.

1

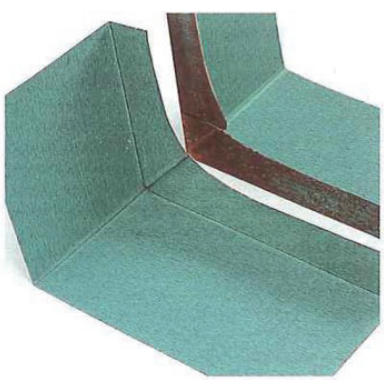


Scribe the tray on the planned fold line and cut to shape. The size of „x" is determined by the line bisecting the angle.

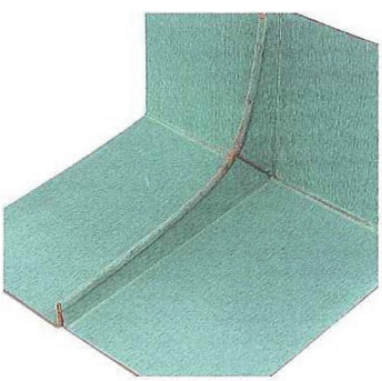
2

Use the seaming iron to pull the tray up along the planned fold line and then bring it into its perpendicular position with a pair of straight large seaming pliers. In doing this, it is helpful to first crease the areas that may bulge when folded.

3



Close the pinched seam with a pair of straight large seaming pliers.

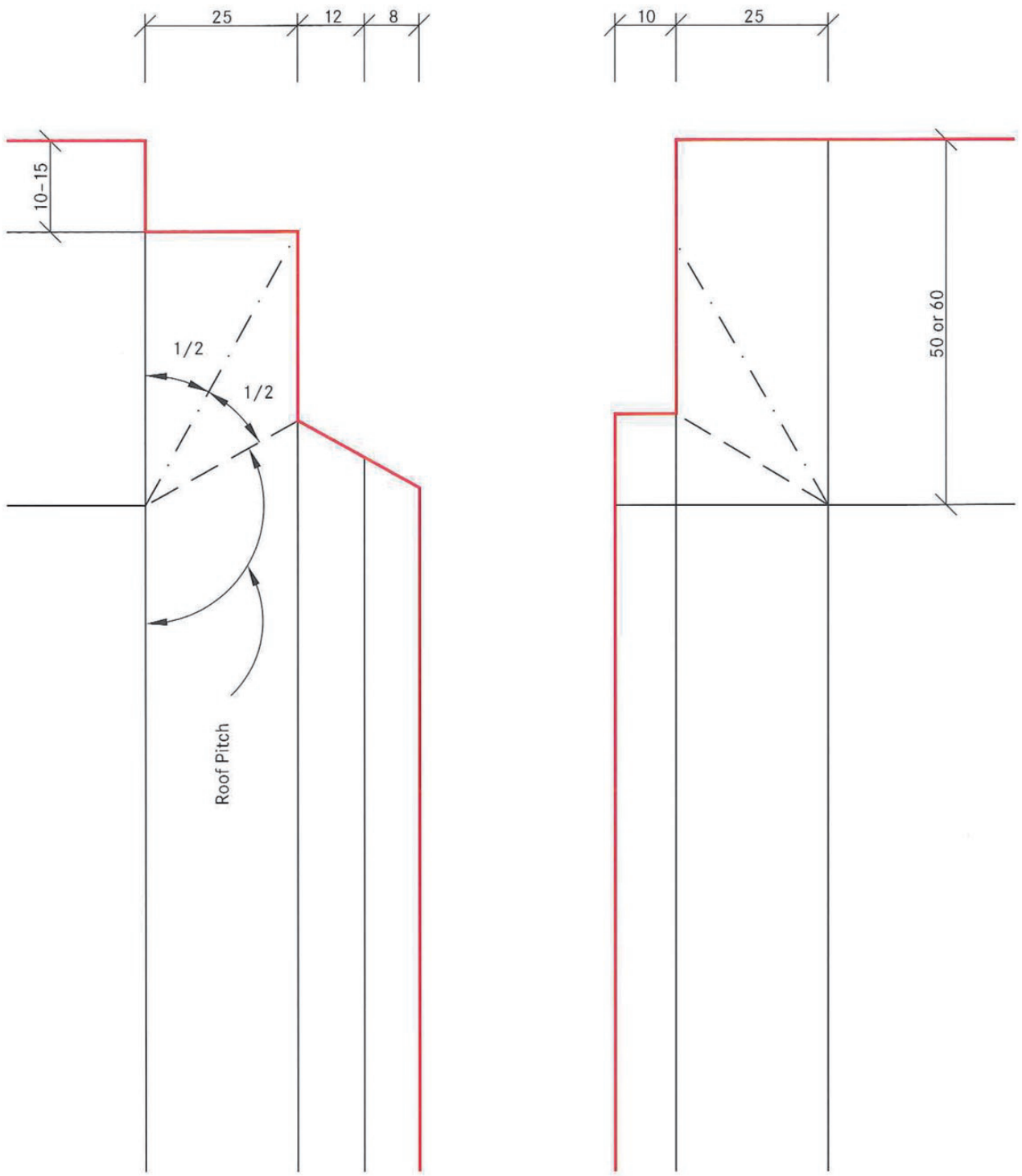


4

Seam the curved area using a sweep seaming hammer and a seaming iron.

Straight dog-eared upstand, preformed, made of TECU® copper

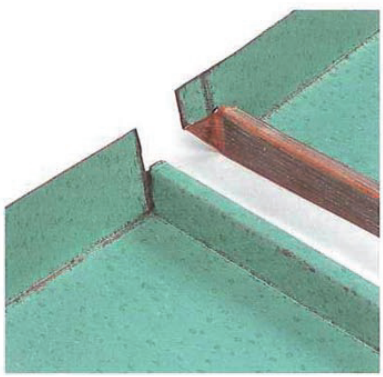
Scale 1:1



Straight Dog-Eared Upstand, Preformed

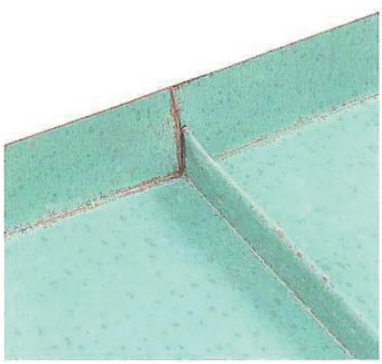
This type of seam is necessary in tight places where a lack of space prevents the use of tools, such as when working up against a ridge batten.

1



The end of the pre-profiled tray is scribed and notched. The head end of the tray is folded to fit the pitch of the roof.

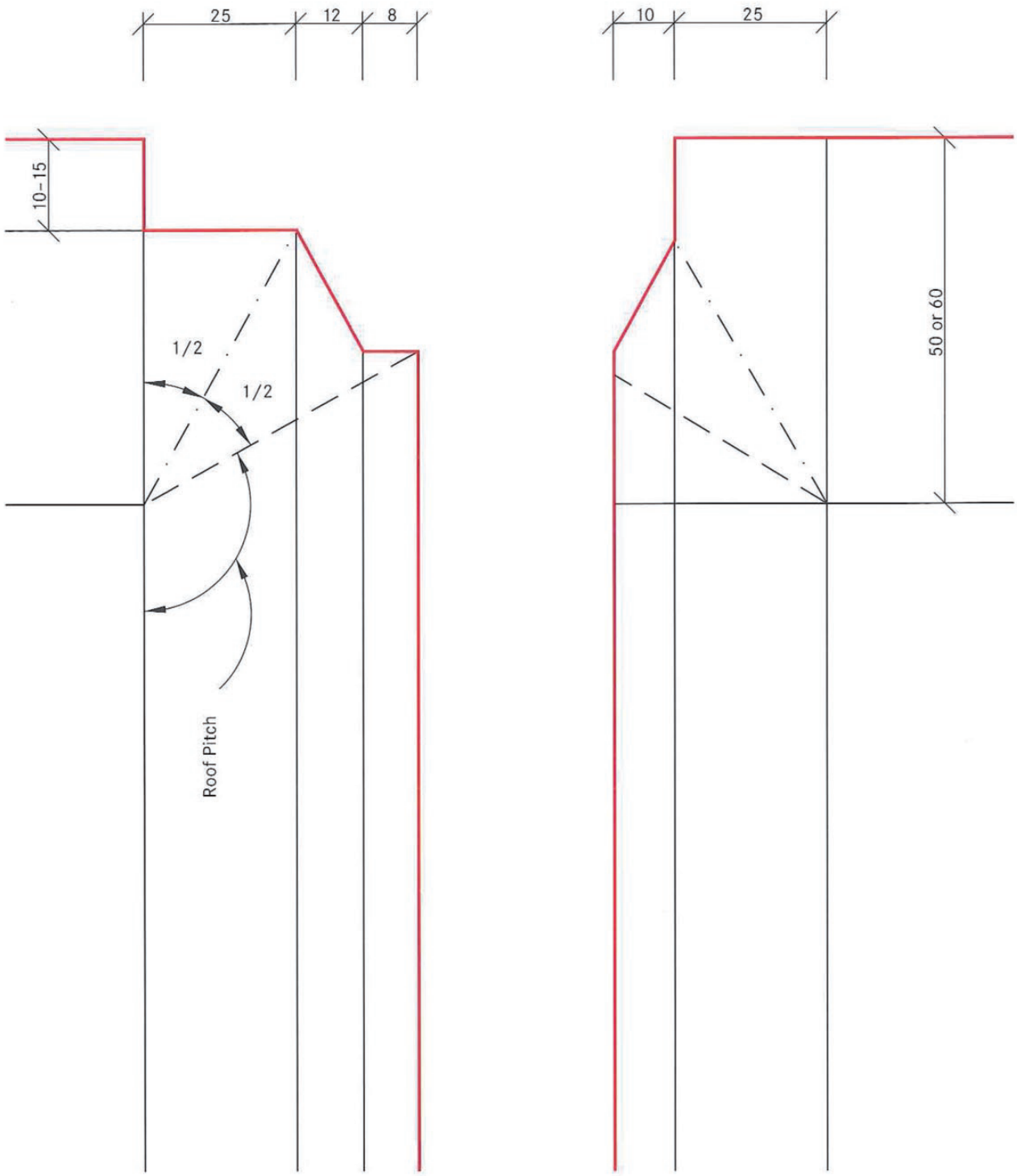
2



Then the trays are hooked together and seamed.

Straight dog-eared upstand made of TECU® copper

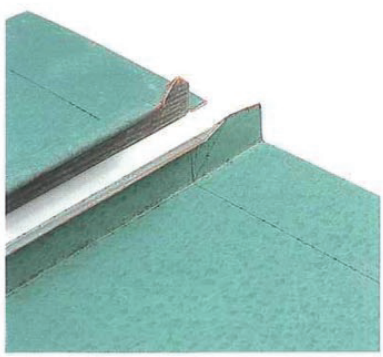
Scale 1:1



Straight Dog-Eared Upstand

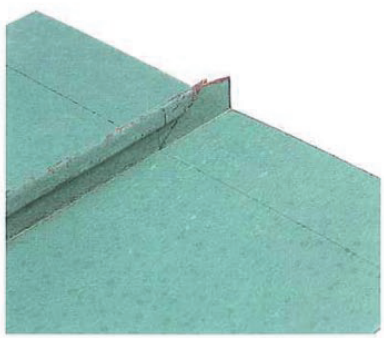
The following sequence of photos depicts the most commonly used method of upstand construction. It allows the installer to cut the trays to individual lengths on site in order to fit them to specific dimensional tolerances.

1



The ends of the trays are cut to size, then scribed and cut.

2

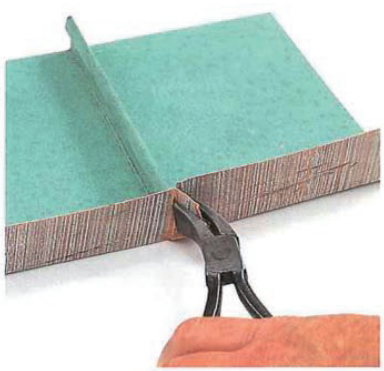


The trays are double-seamed up to the head end.

3

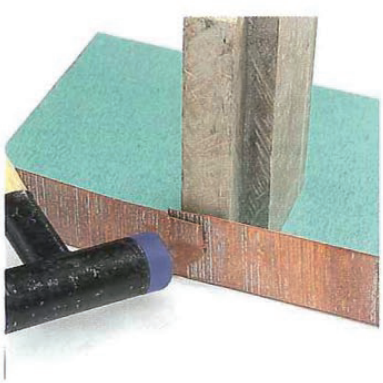
The ends of the trays are erected with straight flat-nosed pliers.

4



The protruding standing seam is bent parallel to the ridge with cranked seaming pliers.

5



On the reverse side, the angled brace is pressed flat with a timber and hammer.

6