

Installation of clay brick roofing and ridge tiles

Pre-conditions

Preparation

Self-inspection

Execution



This **work instruction** is designed for use in detailed planning and preparation of work on construction projects. With thorough planning high levels of personal safety and optimal work apportionment can be achieved at the same time as the work can be organized efficiently and cost effectively.

Work activity & Problem	P	C	Risk= P*C	Action
Fall from roof	3	150	450	fall protection harness - Consider the difficulty on sloping surfaces
Cuts when cutting tiles	3	70	210	
Falling material/crushing injuries	10	15	150	Helmet compulsory
Crane work with tiles, crushing injuries	30	5	150	Education in crane directing/strapping
Cluttered workplace = Twist/fall injuries	10	15	150	Regular tidying

Probability = P	P = 0,1	Assessment of probability	C=0,5	Assessment of consequences	
Consequence = C	P = 1	Very unlikely (<1 times/10 years)	C=1	Trifle	
Risk = P * C	P = 3	Unlikely (1 times/10 years)	C=5	Tiny (1 - 2 days sick leave)	
	P = 10	Low probability (1 times/3 years)	C=15	Small (3 - 7 days sick leave)	
	P = 30	Relative probability (1 times/year)	C=70	Tactile (8 - 29 - " -)	
		Probable (1 times/month)	C=500	Severe (30-299 - " -)	
				Very severe (>300 - " -)	

Text and images from the Working Environment Authority's brochure Safer Construction Work

Personal Protective Equipment § 71

Safety helmet and safety shoes should be used unless it is clearly unnecessary. Other personal protective equipment such as eye protection, hearing protection and gloves should be worn when necessary.

Working safer on roofs § 87-92

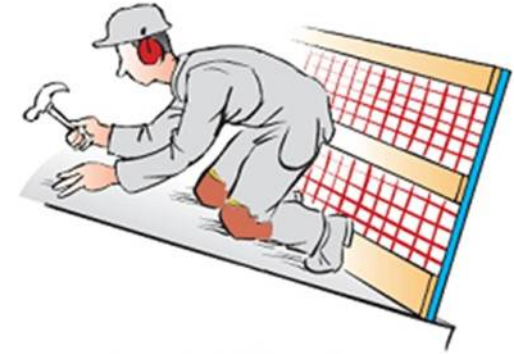
When engaged in roof work it is usual for a guardrail or equivalent protection to be provided. Railings can sit on the eaves or in a position that ends just below the eaves.

Remember that it may need extra strong railings to stop a person who comes at speed down a steep roof.

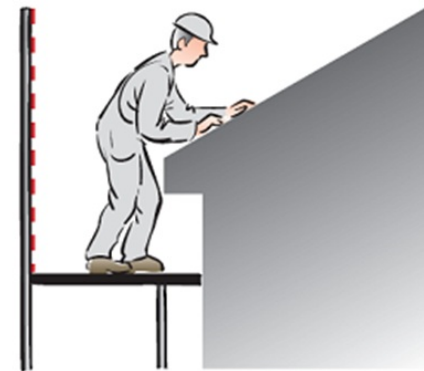
Work safer on roofs § 87-92

The roof work is usually guardrail or equipment that provides equivalent protection used. Railing can sit on the eaves or in a position that ends just below the eaves.

Remember that it may need extra strong railings to stop a person who will sliding on a steep roof.



Guardrail at roofing works



Scaffolding at the roof and fascia work

Text and images from the Working Environment Authority's brochure Safer Construction Work

Fall Protection Harness

Sometimes a safety harness with lanyard as protection is required instead of railings or other protective equipment. § 88 of the Regulations presents how to determine which option to choose.

If the personal fall protection equipment with rope is used, the rope should be attached to a suitable device on the roof, for example, a guard fixture . If this is not possible to arrange then suitable person should be appointed to secure the rope, preferably coupled to a secure grip on a fixed object.

The cord is held taut during work. It is important to check that the brackets are trustworthy. This also applies to fixed guards.

Pitched roofs § 90

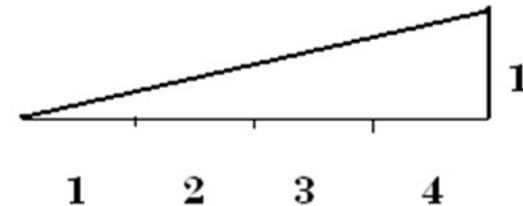
Working on a pitched roof is tiring. If the work to be performed is in a small area, if it is expected to last more than four hours and if the roof slopes more than 1:4 then a horizontal platform must be provided.

This may be necessary, for example, when a chimney or a dormer window is to be faced with metal paneling.



Personal fall protection equipment, full body harness sewn into the vest.

Slope 1:4



Text from the Working Environment Authority's brochure Safer Construction Work

First Aid § 31

First aid should be given. Staff who are trained to provide first aid should always be available. Facilities and first-aid equipment should be marked with signs.

There will also be signs with phone numbers, addresses and, if necessary a route description, for the local emergency services.

Provisions for first aid is also available in AFS 1999:7 "First aid and emergency support".



















Watch out for falling objects § 67

Areas where there is a risk of falling objects should be cordoned off and appropriately marked.

If such areas must be entered then canopy covered walkways or similar shall be organized.



(See also AFS 2008:13, Appendix 3)

 <p>Hoist Load</p>	 <p>Lower Load</p>	 <p>Hoist Load Slowly</p>	 <p>Lower Load Slowly</p>	 <p>Stop</p>
 <p>Swing Boom in direction indicated</p>		 <p>Lower Boom</p>		 <p>Emergency Stop</p>
 <p>Extend Boom</p>	 <p>Retract Boom</p>	 <p>Raise Boom</p>	 <p>Lower Boom</p>	 <p>Signal not understood</p>
 <p>Open</p>	 <p>Close</p>	 <p>Main Hoist</p>	 <p>Auxiliary Hoist</p>	 <p>Finished</p>

Check that:

- Dimensions of the ridge board. Normally 50x100 mm.
- Roof penetrations for hoods etc. performed together with ventilation contractor/designer.
- Roof penetrations for aerators with HVAC contractor and designer
- Steel roofing for canopies, roof, gutters, etc.
- Plan for the accurate setting out of roof battens so that the cutting of tiles is avoided. In the gutters the battens should be laid so that the sloping battens are at the same height as other battens.
- Ceiling cover, sheet metal fittings, cam railing, snow railing, roof ladders etc.

Optimum batten centers

Extruded tiles are a natural product so measurements may vary slightly. To check the delivery one can lay two tiles in width and 11 in height and calculate the mean batten centers.



Equipment and machinery

Basic equipment:

- Tape measure or ruler
- Marker Pen
- Hammer
- Circular saw
- Tile cutter
- Jointing pistol

- Scaffolding at eaves

Materials:

- Brick roof tiles
- Brick ridge tiles + possible half tiles and gable tiles
- Stainless steel nails, threaded stem and at least 3 mm diameter. Length depending on tile thickness and character.
- Stainless steel wire clip 3 mm.
- Nails and staples: to EN 10 088-3-1.4436
- Ridge Sealing Strip or
- Mastic sealant group = 12.5 P

Available:

- Hoods, spigot, roof protective covering
- sheet metal fittings, ridge railing
- snow railing, roof ladder etc.



There is usually considerable tile breakage during handling at construction sites. Good lifting gear makes things easier. “Lifting to the roof” means that the tiles are lifted onto the roof. In this way the tiles will not be stored on site and be in the way. Storage on the roof means less breakage and reduces unnecessary waste. Always strive to get the supplies directly to the installation site.

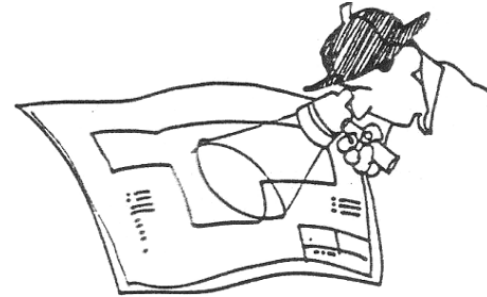


Self-inspection 1(2) Template & instructions

No	Check	Method or equipment	Frequency	Result	Date Signature	Deviation/Remedy Approval/Non-A
1	Battens for the tiles	Right c/c of the battens according to the instructions from the tile supplier				
2	Ridge tiles.	All ridge and specialty tiles shall be nailed.				
3	Laying the roof tiles	Nails and staples to tiles shall be of stainless steel.				
4	-"-	Roof tiles shall be nailed in two tile rows both at the eaves, gable and ridge.				
5	Roof Safety	Contact the chimney sweep concerning the installation of roof safety measures.				
6	Replacement tiles					
7	Documentation	Warranty on frost resistance				
8						
9						
10						
11						

Quality criteria for the project and the product

- Study Drawings, Specifications and Inspection planning
- Think through the alternative **methods of production** and handling of materials, tools etc. that can meet the requirements



Pay particular attention to

- nails shall be stainless steel and 3 mm unless supplier directs otherwise
- sealing of the ridge, eaves and penetrations shall be made according to the specification and the supplier's instructions
- replacement roof tiles must be stored in an appropriate place
- birds strip must be installed at the eaves

The laying process

Always start laying the tiles down in the right-hand corner. Build from right to left and lay out the whole bottom row so that the number of tiles is even. In some cases it may be necessary to add half a tile when working with double arched tiles.

Then lay the tiles in an upwards direction. Starting on the right side and add two – three rows at a time up to the ridge. Use a straightedge to achieve straight, sleek lines. Continue until the entire roof is laid.

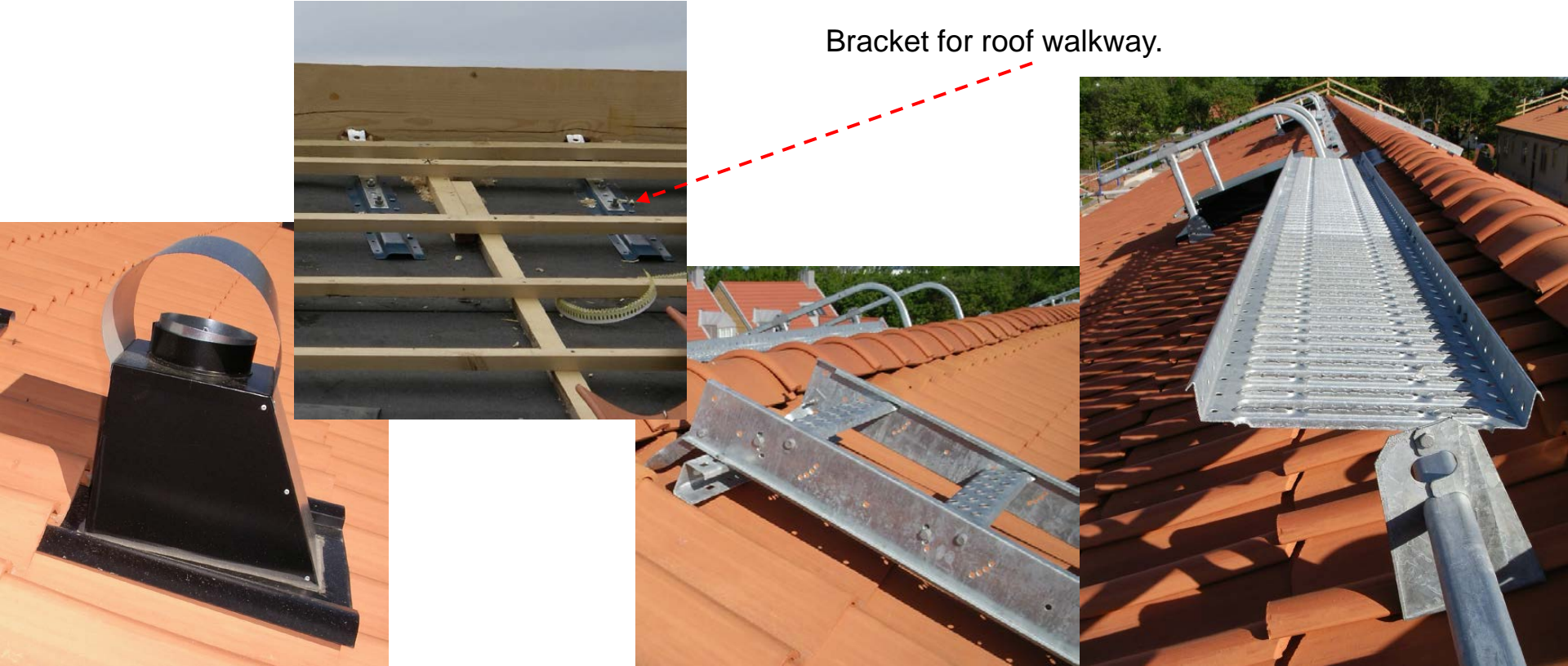
Two tile rows at the eaves, gable and ridge should be nailed, screwed or stapled on to the underlying battens. Use filler pieces and tiles at penetrations, roof valleys, skylights, chimneys, etc. Use stainless steel nails, staples, screws, tile hook or clip.

For roof pitches from 30 to 55° and in weather-exposed situations closer nail centers should be performed (every 5th pan). On roofs with a greater gradient than 55° , all tiles shall be nailed.



Laying roof tiles - Fittings

Hoods, ladders, platforms, hatches, etc. shall be installed concurrently with the tiling activities. Overlapping joints between sheets / tiles should be at least 100 mm.



Installing tiles – ridge tiles

The joint between the ridge tiles and roof tiles shall be sealed. Available as a self-adhesive strip from which protective paper can be torn off. It folds over the ridge board and is pressed into place against the tiles.



Laying of roof tiles

**The ridge tiles are laid last**

The ridge tiles should rest on both the ridge board and the roof tiles. All ridge tiles shall be nailed or stapled to the ridge board. The ridge tile overlap can be adjusted slightly to avoid cutting the last tile. Mount and attach the first ridge tile.

