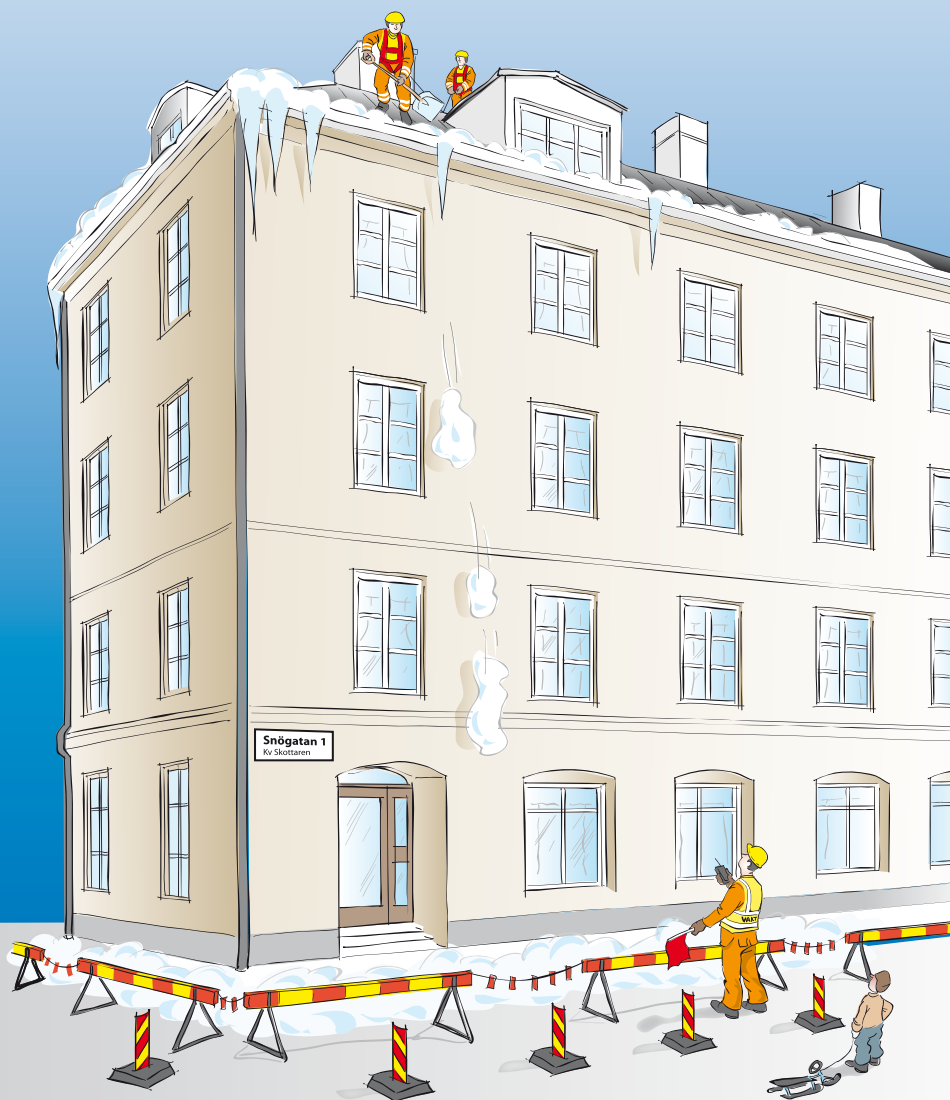


# Watch out down there!



A brochure about safely shovelling snow from roofs

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A special thanks to the Work Environment Authority for their valuable comments on this paper.

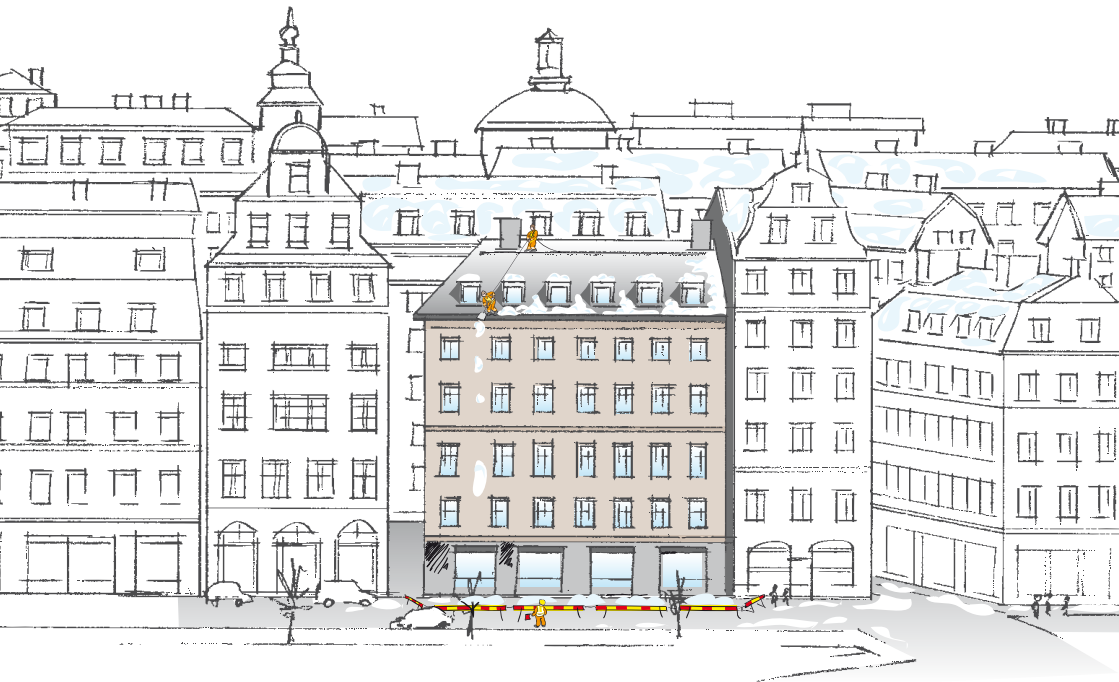
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The main aim of this publication is to improve safety for the people clearing snow from the roofs of buildings and protect the general public from falling ice and snow.

This information can also be used as a guide when introducing and training employees in sheet-metal workshops to increase respect for a risky job.



*Stipulations on planning and executing the clearance of snow on roofs can be found in Building and Civil Engineering Work, AFS 1999:3.*

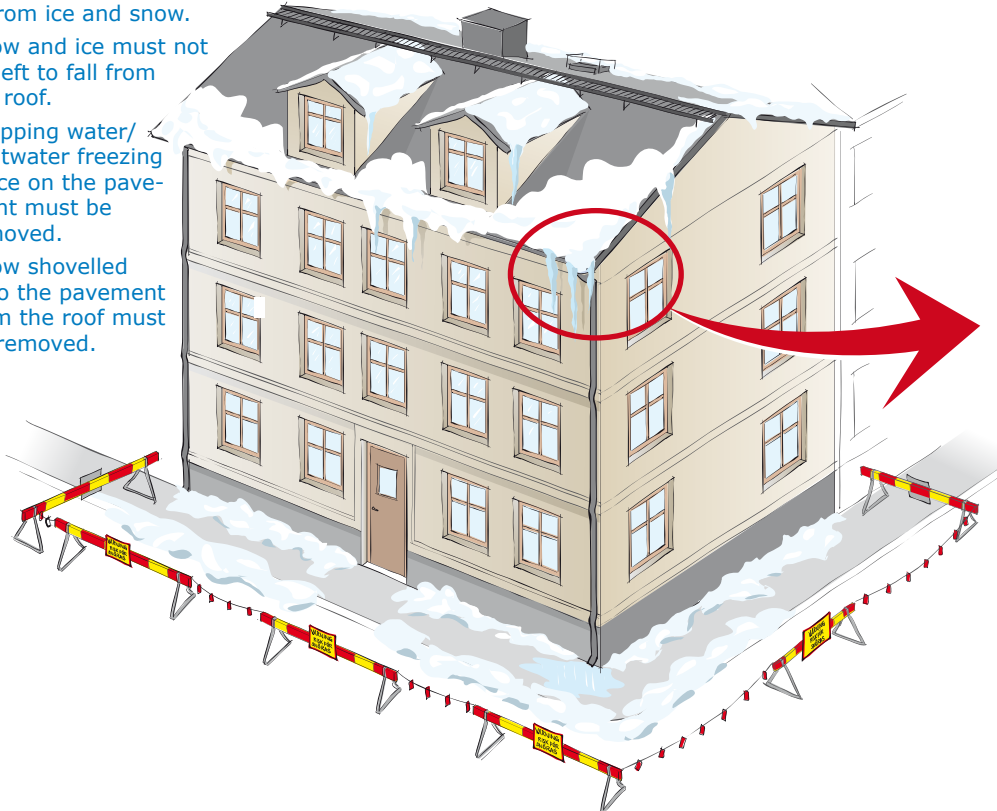
# Shovelling snow from roofs – a risky business

Many serious accidents have been caused by snow and ice falling from roofs.

Working on a roof is always risky but cold weather and ice in winter make it even more dangerous. Working on inclined and slippery surfaces using only personal protection equipment will also exert a high ergonomic load on your body. That is why it is so important for people working on roofs to have prescribed fixed access and protective devices to which to anchor safety harnesses together with a team of trustworthy workmates.

The property owner has a great responsibility to keep the building free from ice and snow.

- Snow and ice must not be left to fall from the roof.
- Dropping water/meltwater freezing to ice on the pavement must be removed.
- Snow shovelled onto the pavement from the roof must be removed.



# Company responsibility when shovelling roofs

There is a risk of icicles and snow slides in winter due to the pitch of the roof in combination with big differences in temperature. It is the property owner who is responsible for monitoring the situation and deciding when the roof must be cleared. The property owner is also responsible to warn of falling snow and ice from the roof by cordoning off the risk zone and setting up warning signs.

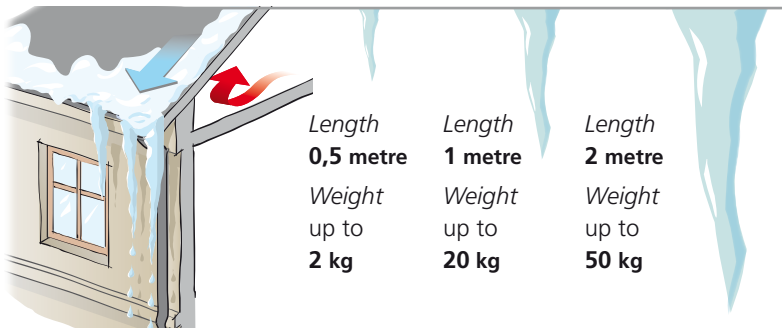
These issues are dealt with in the Public Order Act (1993:1617) Chap 3, Sec 3 second paragraph that says the following:

*“Snow and ice that can fall and injure people or property in a public place shall without undue delay be removed from roofs, guttering and similar devices.”*

Well before the winter’s snow clearing operations, the property owner must inspect the roof and in good time plan for ensuring the roof is fitted with the stipulated fixed access and protective devices.

Maintenance of existing safety features on the roof must be inspected annually. Special attention must be paid to anchorage points.

Owners of properties adjacent to public places with high traffic intensity can reduce the risk of accidents by mounting snow rails and devices to prevent snow slides with anchorage points of the correct strength.



**Cold weather, heat, downfall and leaks can create dangerous icicles.**

*Speed of falling icicles:*  
2 floors– approx. 25 kph  
3 floors – approx. 50 kph  
5 floors – approx. 60 kph

# Sheet-metal workshops are professionals in shovelling snow from the roofs of buildings

Sheet-metal workshops often undertake to shovel snow from the roofs of buildings, possibly under contract with the property owner.

A sheet-metal workshop must do this under the liabilities set out in the Swedish Work Environment Act (SFS 1977:1160) and establish a written risk assessment in compliance with Systematic Work Environment Management AFS 2001:01, Sect. 8.

## Employer liability

The following points are the responsibility of an employer undertaking the shovelling of snow from the roofs of buildings:

- Inspect the roof prior to personnel beginning work.
- Ensure the safety features on the roof are in good condition. In some cases it may be necessary to place extra demands on roof safety.
- Inform the workers of the risks involved with shovelling snow from the roof.
- Ensure employees possess knowledge of and are necessarily familiarised with what must be observed in order to avoid risks.
- Provide personal protective equipment that is suitable and approved for the work in hand – fall protection, protective helmet, protective goggles – and verify that the equipment is used.
- Provide high-vis jackets and communication equipment between workers on the roof and watchmen if necessary.

A major safety factor is that the work is carried out by a well-drilled team with two knowledgeable people on the roof and at least one traffic guard on the ground. It is also essential the work is supervised by personnel with a great deal of knowledge concerning working on roofs.

When accepting the order for snow clearance, the sheet-metal workshop must agree with the property owner on who is to apply for any permits for cordoning off pavements and streets. Temporary short-term cordons can be made without permits when clearing snow from roofs.

# Employee liability

The employee shall follow current stipulations, use protective devices supplied and observe necessary caution.

If the work involves immediate and serious danger to life and health, the employee shall inform the employer or safety officer immediately. Employees are entitled to stop work while waiting for a response.

## Personal fall protection – life insurance

- Make sure the seams on safety harnesses are in good condition and that other details are not damaged.
- Make sure lines and adjustment devices are not damaged and are in working order.
- Harnesses and lines shall be stored suspended dry, dark and ventilated.
- Equipment that is torn, has defect seams, mechanical faults or is rusty must be destroyed.
- Lines that have been dropped over the edge of a roof must be destroyed.

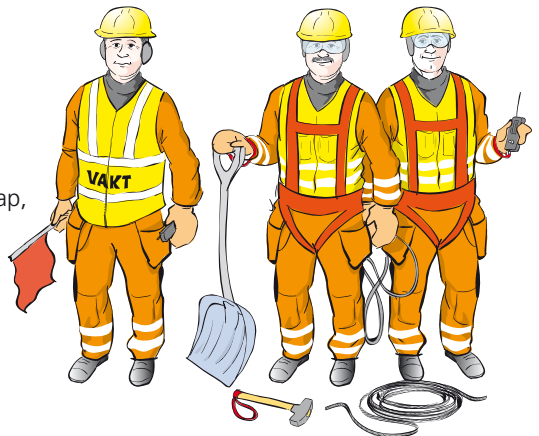
## Teamwork

### The man in the street

Is to be equipped with protective helmet, high-vis jacket and signalling device as well as communication equipment to the workers on the roof, a whistle, siren or telephone.

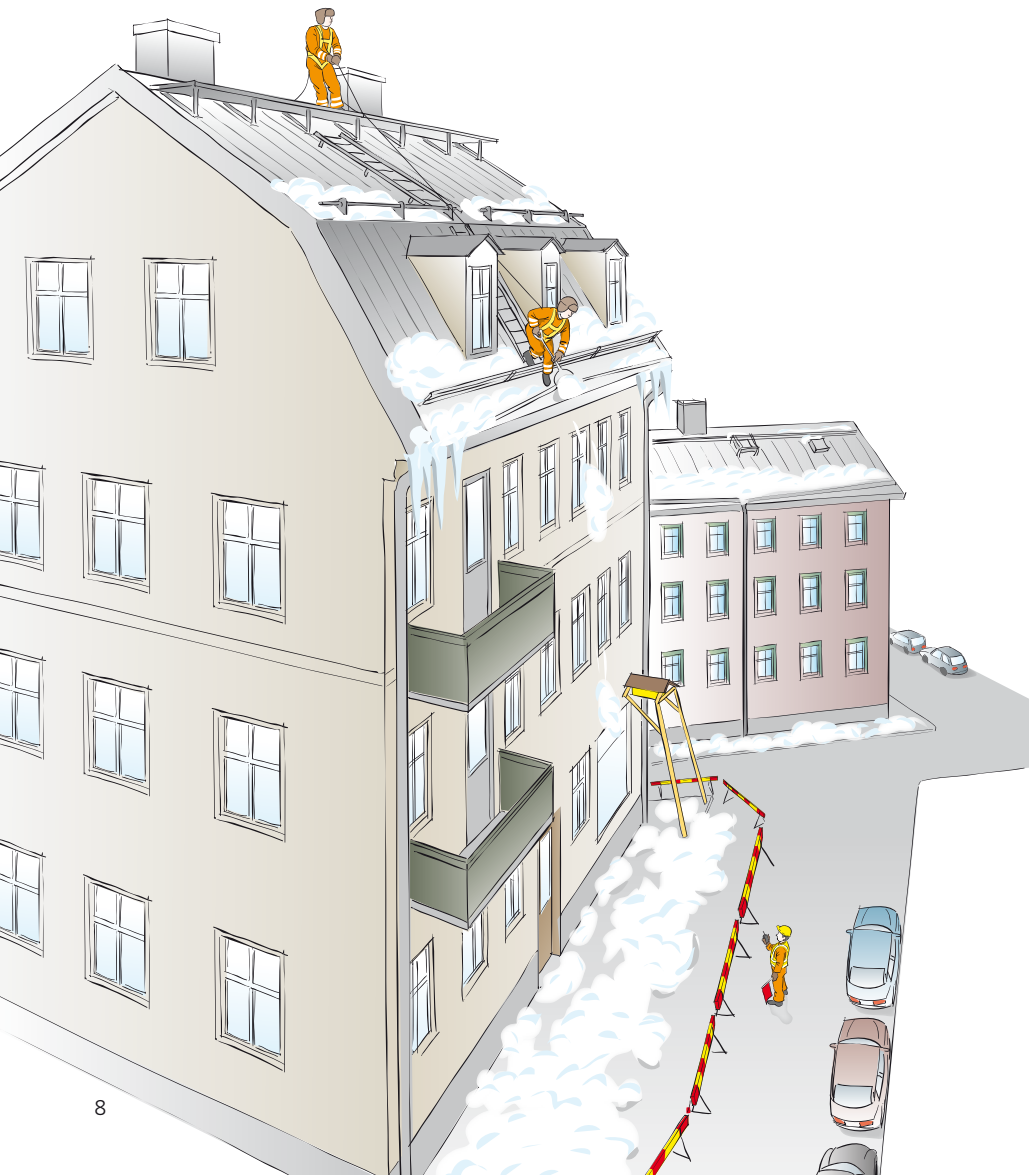
### Workers on the roof

Is to be equipped with line and safety harness, eye protection against ice fragments, snow shovel with wrist strap, small sledge hammer with wrist strap for cracking ice and warm, flexible clothing, suitable footwear and communication equipment to the man in the street.



## Safe shovelling from roofs

- The team must first be given information on access routes and the keys to roof level. Check whether there are heating cables in drain inverts. If so, there must be warning signs concerning heating cables at the point of ascent to the roof.
- The required protective covering of balconies, shop signs, etc. is performed by separate agreement with the client and before the work begins.





- Fixed protective devices must be checked before work starts. Any skylights that have been covered by snow must be marked.
- Depending on its pitch and height, the roof must be fitted with fixed access and protective devices such as anchorage points for safety lines. There should be catwalks installed all along the ridge of the roof if the face of the building is at least 8 m high and the roof pitch greater than or equal to 6°.
- There should normally be two persons on the roof when shovelling snow. One person is to move the anchorage points for the line and keep it taut while the other is to carry out the actual shovelling.
 

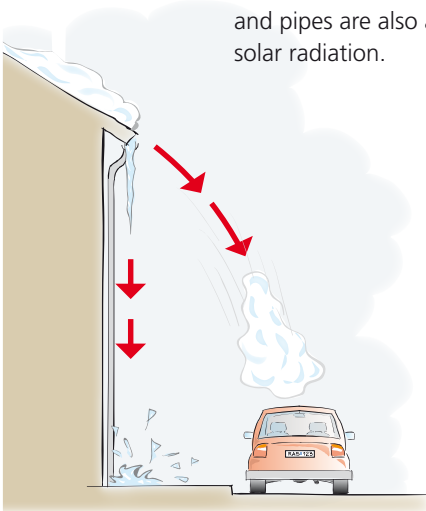
The person not shovelling must always have signal contact with the traffic guard on the road/ground to avoid accidents.
- Both people on the roof should be well anchored before starting work. Further lines may be needed on roofs with steep pitches, 45° or more, for extra safety
- Hand-held tools, such as shovels and light sledge hammers for cracking ice, should have wrist straps to prevent them from accidentally sliding off the roof and becoming a risk factor.
- Protective goggles are required when cracking ice.
- On roofs with gutters filled with snow and ice, and with icicles hanging from the eaves, the gutters can be cleared and icicles removed first with "partial clearing" if the property owner should request it.
 

This can be done if the roof also has a snow rail mounted one metre above the gutter plus a ladder stretching from the ridge to the gutter on each slope of the roof. Otherwise, snow and ice will slide into the gutter again.

## Snow slides and avalanches

Start shovelling from the ridge of a saddle roof to avoid being brought down with snow sliding off the roof. Workers may also cause "avalanches" when they walk on the roof. Roofs with pitches between 18° and 45° are most prone to snow slides/avalanches. The roofing material also has varying friction.

The risk of snow slides and the formation of ice in gutters and pipes are also affected by the direction of the roof and solar radiation.



### **Remember that...**

... icicles drop straight down with a powerful force.

Snow slides along the roof incline and may therefore end up further away from the building.



### **Also remember that...**

... .. cooperation between the workers on the roof is an important safety factor. The line should be kept taut and anchored straight above the person shovelling.

## Shallow pitch roofs below 6°

The snow load on roofs with shallow pitches may be more than the roof is designed for and must therefore be cleared.

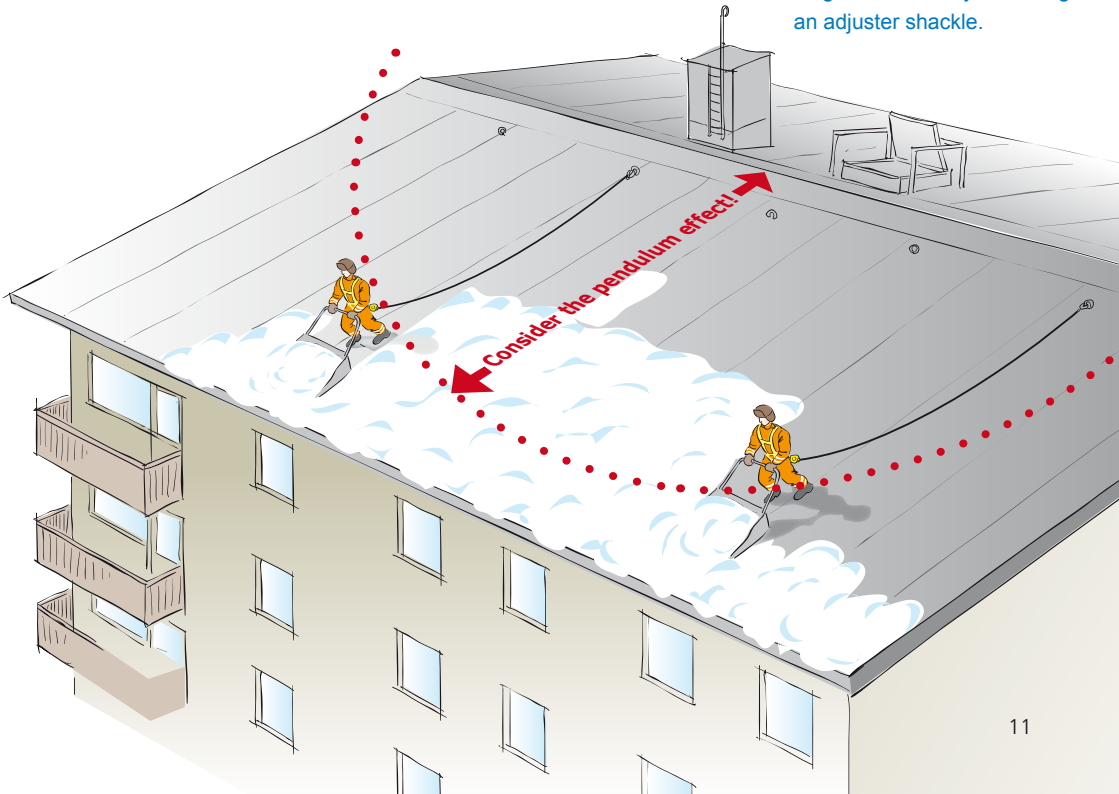
In this case, the snow can be cleared by several people. Use a snow pusher that can transport the snow directly to the edge of the roof and be tipped over to avoid point loads on the roof structure. If the face of the building is higher than 3 metres, the roof should be fitted with anchorage points, at least eyebolts, irrespective of the pitch of the roof. The safety line must never be long enough, from its anchorage point to the worker, for the worker to fall over the edge of the roof.

Consider the pendulum effect when working from side to side! Anchor as close to the vertical as possible. A safety line used for work on a roof should normally not exceed 10 metres in length.

**NB!**  
**Use a safety harness,**  
**not a waist belt.**



The worker can adjust the length of the safety line using an adjuster shackle.



## Cordoning off the area of risk

Measures need to be taken to safeguard people and property from falling snow and ice as well as when snow is being shovelled from the roof. This can be done by cordoning off the risk area. Such a risk area can be compared with roadworks so regulations concerning markings for roadworks can be used where suitable.

As it is the Road Authority only that is allowed to erect traffic facilities, it should be contacted to agree on which facilities to use and how they should be erected. The road authority is usually the local council (the street) or the property owner (the courtyard).

Signs with information concerning the risks involved should be posted on the closure devices and in doorways and other places where people may be standing.

See 81-85, AFS 1999:03 for directions on how a guard is to direct traffic.



Shovelling snow from roofs places great demands on safety zones, signing and safety guards.

## **The following should be considered when shovelling snow from the roof:**

- The risk area boundary must be clearly marked with closure devices.
- At least one guard should be placed in the street/on the ground.
- The guard must bear a protective helmet and high-vis jacket and be equipped with a red flag to stop the traffic.
- The guard must prevent traffic and pedestrians entering the risk area when there is a chance of falling ice and snow.
- The guard must stay in contact with the workers on the roof.

## **Good signalling system essential**

Signalling between workers on the roof and the traffic guard on the street is extremely important to avoid accidents.

Signals must be conveyed clearly. In order to do this, a whistle, siren or telephone will be needed.

Every member of the team must know how to interpret the signals.

To safely remove snow and ice from a roof, the following signals can be sent:

**One signal – *Stop!***

**Two signals – *Get going!***

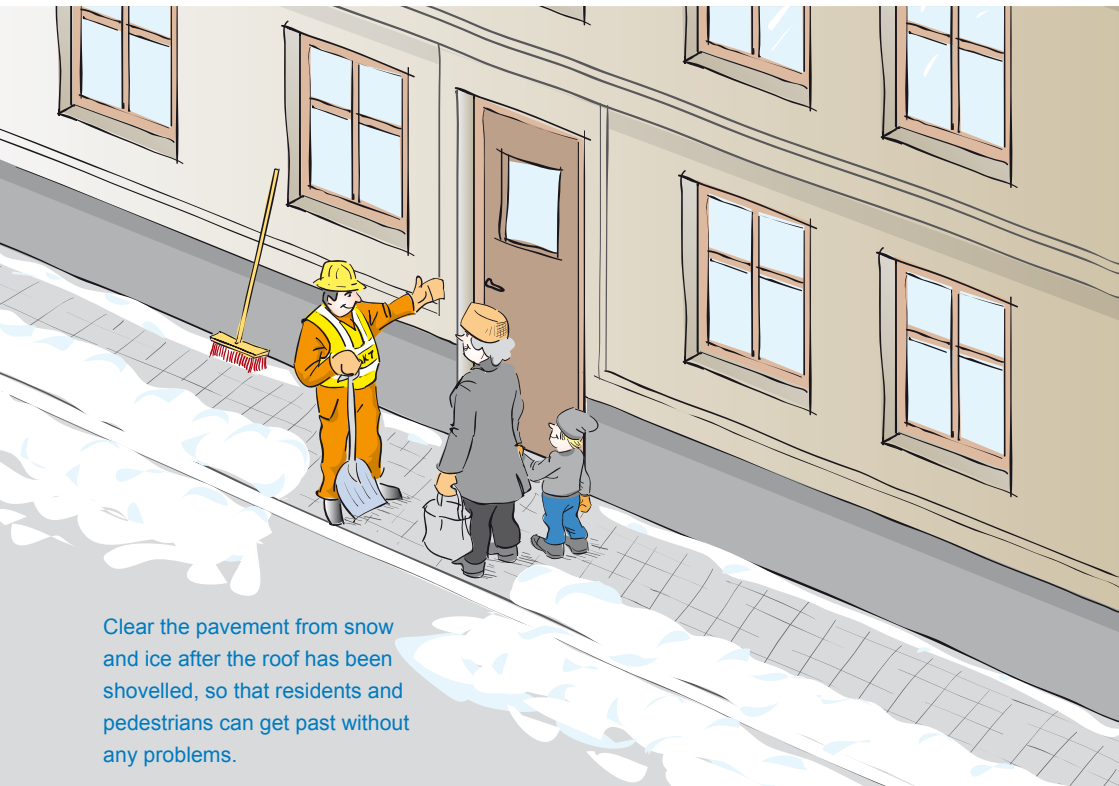
## When finished clearing the snow

The warning signs must be removed once the snow has been cleared away. Snow that has been shovelled from the roof must be cleared away from building entrances.

Pavements must be cleared to provide pathways while waiting for snow and ice to be carried away as agreed with the property owner and contractor.

## Damage to roofing material, etc.

The employer shall always be informed of any damage caused to roofing material, parked cars, etc., no matter who is liable for the damage. Insurance must be made available to cover injury and damage.



Clear the pavement from snow and ice after the roof has been shovelled, so that residents and pedestrians can get past without any problems.

## Injuries to third man – what measures are to be taken?

Any personal injuries or damage to property during snow clearing must be reported immediately to the employer. The employer will then report the injury or damage to their insurance company for claims adjustment.

Company personnel must adhere to given instructions and directions in order to avoid personal liability.



**Accidents do not need to happen if everything has been done correctly from start to finish.**

# Watch out down there!



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