



ARBETSMILJÖ
VERKET

Safer building and civil engineering work



Everyone profits from a good working environment. The risk of injuries decreases and the work becomes more efficient. Arbetsmiljöverket, the Swedish Work Environment Authority, is the Swedish state regulatory agency responsible for working environments. We inspect the working environment at construction sites and are empowered to impose requirements regarding measures to make the working environment acceptable, if needed.

If the risks are too great, we are empowered to order work to be discontinued until improvement measures have been implemented. Such orders must be signed, but the signature serves only as acknowledgement that the employer has received a written copy of the order.

Many construction workers suffer accidents and occupational illnesses. They fall, work in unsuitable work postures, lift heavy objects, or are injured by machinery. Poor planning and time pressure increase the risk of accidents.

There are laws and regulations issued by the Swedish Work Environment Authority concerning how building work shall proceed. This brochure provides information about certain minimum standards.

Work performed to build, modify, repair, maintain, or demolish buildings or civil engineering works is subject to the Swedish Work Environment Act and to building regulations issued by the Swedish Work Environment Authority.

Swedish work environment regulations apply to foreign workers in Sweden, regardless of whether the worker is employed by a foreign company, contracted by a Swedish employer, or works as an independent business owner. Both the business owner and the employees are included, regardless of the form of employment.

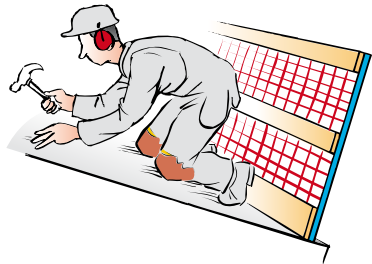
Reduce the risk of falls

Falls are the most common cause of deaths and accidents at construction sites.

The risk of falls shall be averted. If the difference in level is more than two metres, some form of protection is generally required. Guardrails, work platforms, work baskets, scaffolding or similar protection should preferably be used. Protection may be needed even at lesser differences in level, e.g., if water or sharp objects are below.

Guardrails shall be:

- Firm
- At least one metre high
- Be equipped with a main guardrail, an intermediate guardrail and a toe board. They may be made in other ways, but shall afford at least equal protection.



When *roof work* is performed, a guardrail or equipment providing equivalent protection shall normally be present. Install the guardrail on the eaves or on scaffolding that reaches up to just below the eaves. Extra-strength guardrails may be required to stop a person who falls at high speed down a steep roof.



If fixed protection cannot be installed, personal safety equipment with a harness shall be used. A waist belt can cause serious injury and shall not be used. Secure the safety line to a permanent structure on the roof. Check that the attachments are reliable. If a safety line cannot be attached anywhere on the roof, it may be wound around a permanent structure and held taut by another person.

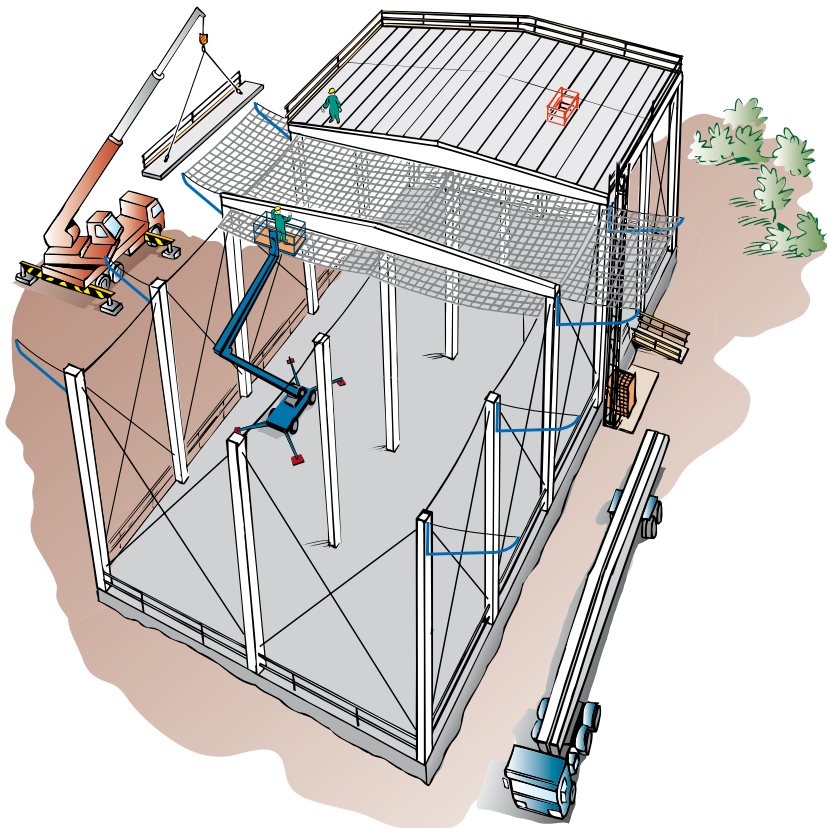


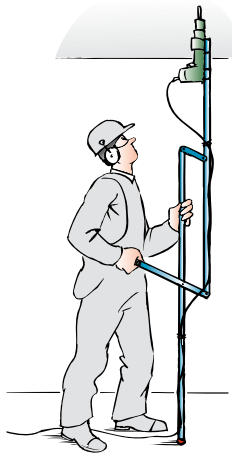
There may be risk of stepping through surfaces whose load-bearing capacity is inadequate and such areas should be cordoned off. Use special safety equipment if work shall nevertheless be performed on such a surface.

Safety nets are appropriate in connection with certain work. It is vital that someone with adequate knowledge and experience inspects the net and its installation before it is used.

If work is to be done for more than four hours in a small area on a gradient steeper than 1:4, a horizontal work surface shall be provided.

Hard hats and safety shoes shall normally be worn. Eye protection, hearing protection and gloves may also sometimes be needed.





Heavy lifting and unsuitable work postures strain the body

Construction work is often heavy and strains the body, so lifting equipment shall therefore be available to transport building materials. Machinery and tools shall be ergonomically designed.

Working from a ladder for any appreciable length of time is not good for the body. A flat surface to stand on, such as a platform that can be raised and lowered, provides a better work posture.

The muscles in the body must be given time to recover after exertion. Avoid monotonous strain on the muscles by varying the work.

Regulations on chemical substances in Sweden

Many toxic, carcinogenic, corrosive or allergenic substances are used in the building industry. Concrete, mortar and plaster, for instance, contain cement, which can cause caustic wounds upon extended contact with the skin. Other products that often contain hazardous substances include adhesives, paints and two-component products. Building dust and mineral wool fibre are also considered hazardous because they can affect the respiratory passages if they are inhaled.

Supplier's material data safety sheets must be available at the workplace for all chemical products that contain one or more hazardous substances. The material data safety sheet shall be written in Swedish for all products purchased in Sweden. Companies that import a hazardous chemical product to Sweden for their own use are liable for ensuring that written risk and safety information about the product is available at the workplace in a language that the people who will be using the product can understand.

A list of all hazardous chemical products shall be available at the construction site. All employers are responsible for this.

The employer shall inform workers about the risks associated with the hazardous chemical products and make sure that workers have understood the information.

Particularly stringent rules apply to certain hazardous substances:

Asbestos: Companies that are going to handle and remove asbestos must have a permit from the Swedish Work Environment Authority. Documented special training and a doctor's statement are required for a permit to be granted.

Thermosetting plastics: Training and a medical examination are also required before work with thermosetting plastics (such as joint foam containing isocyanates, epoxy adhesive, epoxy paint, etc.) is commenced.

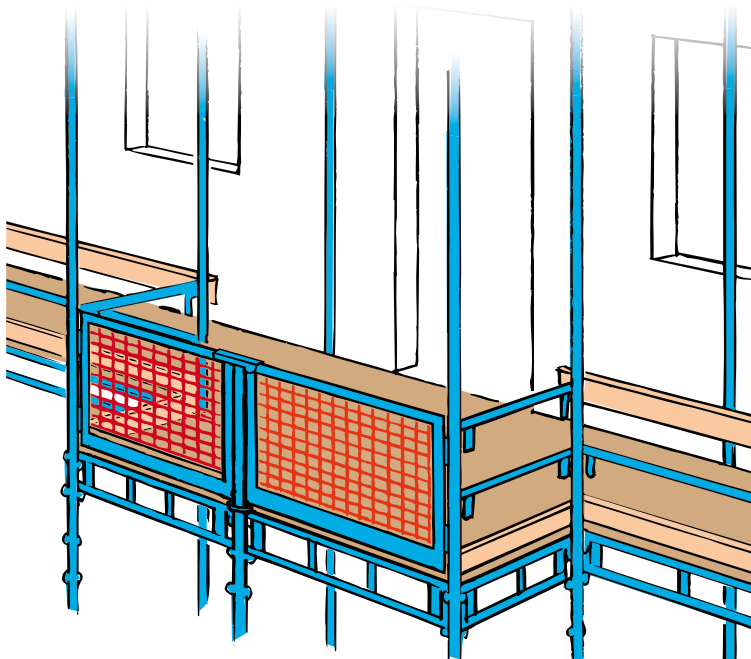
Violation of these regulations is a punishable offence and may lead to heavy fines.

Communication routes and transports

Construction sites shall be provided with safe communication routes, such as stairs or ramps between different levels. When the difference in level is more than ten metres a lift shall also be provided, if workers would otherwise be required to use stairs frequently.

Communication routes for motor vehicles inside the construction site shall be provided with adequate safety clearance or safety devices.

It must be possible to transport materials between levels without removing guardrails or other safety devices. If this is impossible, transport shall be carried out via loading bays, load openings in façades, ramps, or special transport systems.



Manuals for lifting devices, machinery and certain other products

When a machine or lifting device is delivered or put into use in Sweden, a written manual in Swedish must be provided. The supplier is responsible for this. A person or company that imports a machine for use in Sweden is also considered a supplier. Information about what the manual shall contain is available in Swedish Work Environment Authority regulations on machinery.

Written instructions in Swedish must also be provided upon delivery of prefabricated scaffolding and shall be available at the workplace. Swedish Work Environment Authority regulations on scaffolding stipulate what the instructions shall contain.

When a machine, lifting device, scaffolding, etc., is used in construction work, the workers affected shall have access to instructions for these machines. The instructions shall be written in a language that the workers can understand.

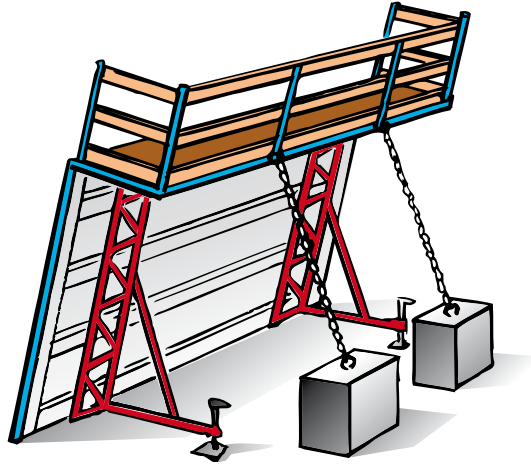
CE marking, type approval and inspection of lifting devices, machinery and certain other products

New lifting devices and machinery shall in general be CE marked in order to be permitted for use in Sweden. If delivered in Sweden, pre-fabricated scaffolding and ladders shall be type inspected (ladders shall also be certified) by an accredited body.

Many machines and lifting devices shall be regularly inspected in order to be permitted for use. It is a punishable offence to use machines and lifting devices that have not been inspected or if notified shortcomings have not been corrected. The inspection shall be performed in accordance with Swedish regulations.

Additional things to keep in mind...

Serious accidents can happen if stored building materials start moving, e.g., because of strong winds. For this reason, it is important to stabilise the material. Weather protection against wind and cold may sometimes also be necessary for construction workers.



Cordon off and mark areas where there is risk of falling objects. If people nevertheless need to walk in such areas, a protective roof shall be provided.

Plan earthworks so that the ground is not subjected to loads greater than it can bear. Protection against landslides/earth slip shall be provided if necessary. Check to make sure there are no pipes, utility lines or hazardous substances in the ground and that there is no risk of machinery falling into the pit. Vehicular traffic shall be kept away from excavation pits.

Passing vehicular traffic at the construction site is a risk. If possible, traffic shall be diverted. People working in a place not partitioned off from traffic shall wear high-visibility clothing with reflectors.



If an emergency occurs

Everyone shall quickly and safely evacuate the workplace, e.g., in case of fire. Escape routes and assembly sites shall be marked with signs. Doors for evacuation shall open outwards and fire-fighting equipment shall be easily accessible.



First aid shall always be available and signs shall be posted showing the location of supplies and areas where first aid can be administered. A notice board displaying telephone numbers to ambulance and rescue services, the address of the workplace and possibly directions to the workplace shall be provided. Remember that the person who calls must be able to communicate with Räddningstjänsten, the Swedish Rescue Services Agency. Rescue Services personnel normally understand English.

If a power cut would expose workers to particular risk, emergency lighting shall be provided. This applies, e.g., to work with construction saws and installation of scaffolding.

The safety and health (work environment) plan

A safety and health (work environment) plan shall be assembled before the construction work site is established. The planning and design co-ordinator for the construction work environment will see to it that this takes place. The project supervisor or employee who assumes this responsibility is also responsible for drawing up the plan. The intent is that the safety and health (work environment) plan shall be used throughout the entire construction phase. The work performance co-ordinator for the construction work environment shall see to it that the plan is available at the construction work site as soon as it is established. The co-ordinator shall also implement any necessary adjustments to the plan. If construction or installation work shall be performed at a location where other operations will be in progress at the same time, the plan shall take this into account.

The plan shall contain the following:

- The regulations that shall apply to the construction work site
- A description of how safety and health work shall be organised
- A description of the safety and health measures that shall be taken during the construction phase in order to provide a good working environment. This concerns work such as the following:
 - Work entailing risk of falls
 - Excavation work entailing risk of landslide/earth slip
 - Work with certain chemical or biological substances
 - Work near high voltage power lines
 - Work entailing risk of drowning
 - Work in wells and tunnels
 - Work involving use of explosives
 - Work involving installation of heavy structural components
 - Work in a place or area with passing vehicular traffic
 - Demolition of load-bearing structures or materials/substances hazardous to human health

Prior notice

The project supervisor shall, except in smaller jobs, submit a prior notice to the Swedish Work Environment Authority (in the nearest district) before work commences; see §7 of the regulations. The project supervisor shall also see to it that a copy of the notice is posted at the construction work site and that it is kept updated.

Planning and information

All work shall be planned and risk assessments carried out sufficiently in advance to ensure that work can be performed safely. Areas for storage sheds, workshops, and depots, as well as communication routes and transports shall be planned. It is important to determine how workers shall access all workplaces. The work shall be planned so that different activities do not conflict in a way that causes risk of ill health or accidents. Scheduling is particularly important if the work is comprehensive but construction time is short.

Methods and equipment should be chosen that:

- Help prevent accidents due to falls or landslides/earth slips
- Aid in avoiding bodily strains that are unnecessarily tiring or hazardous to health
- Ensure low exposure to noise, vibrations, hazardous substances and air pollution.

Workers shall be informed about the work, which safety and health (work environment) measures have been implemented or planned, which rules apply. They may need special training or instruction if new products or methods shall be used.

Construction sites are prone to fast and constant changes that entail many risks. Regular safety inspections are critical.

Who is responsible for what?

To create a good working environment at a construction site, preventive safety and health work is important; all participants must assume their respective responsibilities. Moreover, it is important that the various participants work together and that construction workers contribute to the safety and health work.

The person in charge of carrying out construction or installation work (the **project supervisor**) has the main responsibility of taking the working environment during the construction phase into account during preparations for the construction project (planning and design). The project supervisor is also responsible for drawing up the prior notice, the safety and health plan, and documentation, and that a co-ordinator for the construction work environment is assigned.

In addition, the project supervisor is responsible for co-ordinating the performance of construction and installation work from a safety and health standpoint, and shall also assign a construction and installation work co-ordinator for the construction work environment.

In certain cases, the project supervisor can, through written agreement, transfer the responsibility for safety and health to an employee for the portion of the construction project included in the assignment. This can be done if the assignment entails being independently responsible for all the planning and design and/or the entire implementation of the project, for example in general or turnkey contracting. In a divided contract, the project supervisor's responsibility cannot be transferred.

The **planning and design co-ordinator for the construction work environment** shall co-ordinate the project with regard to the working environment and shall see to it that the safety and health plan and documentation are drawn up.

The **construction planners** (architects, consultants, and so on) are also responsible, within their assignments, for taking the working environment into consideration during preparations for the construction project.

The **construction and installation work co-ordinator for the construction work environment** shall co-ordinate the work from the standpoint of the working environment, adjust the safety and health plan to how the work is actually carried out, verify that the work is being carried out correctly from the standpoint of the working environment, and that the safety and health plan is being followed.

The other companies in the joint work site shall submit information to the work performance co-ordinator for the construction work environment on the particular risks that could arise owing to their own activities. Everyone operating in the joint work site shall follow the regulations and rules for protection that the co-ordinator draws up.

All employers have main responsibility for the work environment of their employees. Employers' responsibility for their own employees applies in full, even if there is another responsibility at the same time, for example those carrying out the planning, for those who have manufactured a machine used in the work, or for those who are co-ordinators for the construction work environment.

Sole traders and people who work in family-owned businesses with no employees shall essentially comply with all provisions that apply to employers and employees in construction and installation work.

Construction workers shall participate in work environment efforts, comply with laws and regulations, and use the necessary safety devices.

The safety representative represents employees on safety issues. If a job entails a direct, serious risk to life or health and the employer does not immediately remove the risk, the safety representative has the right to stop the work pending a ruling by the Swedish Work Environment Authority.

Manufacturers, importers, and renters of technical devices are liable for ensuring that their products are safe. Manufacturers and importers of chemical and other products have a similar responsibility. Manufacturers, importers, and renters shall also submit the product information necessary to prevent ill health and accidents.

There are also regulations in the Swedish Work Environment Act on the responsibilities of those who **hire labour** and for those who **supervise a work site**.



ARBETSMILJÖ
VERKET

**Additional copies of this publication
can be ordered from:**

Swedish Work Environment Authority,
publication services,
112 79 Stockholm.

Tel. +46-(0)8-730 97 00

Fax +46-(0)8-735 85 55

www.av.se

ADI 539 Eng

Our vision: Everyone wants to, and can, create a good work environment