



SWEDISH  
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# Building and Civil Engineering Work

Provisions on Safety and Health on Building and Civil  
Engineering Work, together with General Recommendations  
on the implementation of the Provisions

*Amendments up to March 25, 2014 included*

## **Translation**

In the event of disagreement concerning the interpretation and content of this text, the printed Swedish version shall have priority.

Provisions and general recommendations adopted by the Swedish Work Environment Authority are published in the Swedish Work Environment Authority's Statute Book (AFS).

Provisions are binding rules. General recommendations have a legal status different from that of provisions. General recommendations are not binding but contain recommendations on the implementation of the provisions which state how someone can or should act in a certain respect. They may, for example, inform on appropriate ways of fulfilling the requirements and point to practical solutions.

Please note that references to statutes always give the original number of the document concerned, regardless of any subsequent amendments and reprints.

Concerning amendments to and reprints of Provisions of the Swedish National Board of Occupational Safety and Health and of the Swedish Work Environment Authority, reference is made to the latest Statute Book Register of provisions and general recommendations.

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## **Provisions of the Swedish National Board of Occupational Safety and Health on Building and Civil Engineering Work**



Adopted 29th April 1999

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*Amendments up to March 25, 2014 included*

The following Provisions are issued by the Swedish National Board of Occupational Safety and Health pursuant to Section 18 of the Work Environment Ordinance (SFS 1977:1166)<sup>1</sup>

### **Scope and definitions**

#### **Section 1**

These Provisions apply to the planning and conduct of building or civil engineering work. They also apply to project preparation and design of building or civil engineering work in so far as this affects health and safety conditions (the work environment) for the persons doing the work.

The following are examples of building and civil engineering work:

1. excavation
2. earthworks
3. construction work (building)
4. assembly and disassembly of prefabricated elements
5. installation of interior fittings or equipment
6. alterations
7. renovation
8. repairs
9. disassembly
10. demolition
11. on-going maintenance
12. periodic maintenance, painting and cleaning work
13. drainage
14. decontamination

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<sup>1</sup> Cf. Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC). (OJ no. L245, 26.8.1992, p.6, Celex 31992 L0057).

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### **Section 1a**

The stipulations of Sections 19, 21, 31, 45, 48, 71 and 85 are also applicable to the planning and execution of winter road maintenance. The stipulations of Sections 19, 48 and 56 a, Section 60 (3), Sections 60 a, 86 a, 87, 89 and 92 a are also applicable to the planning and execution of snow clearance on roofs.

### **Section 1b**

These Provisions do not apply to the design of work premises used for the work.

### **Section 2**

Persons professionally engaged, either alone or together with a family member, in building or civil engineering work without an employee shall, in addition to what follows from Chap. 3, Section 5 of the Work Environment Act, comply with the provisions of Chap. 2, Sections 1-8, Chap. 3, Section 2, 1st and 3rd paragraph, Section 2a, 1st paragraph and Sections 3-4 of the same Act.

In addition they shall comply with these Provisions and with such other Provisions as the National Board of Occupational Safety and Health or the Swedish Work Environment Authority may have issued, pursuant to the Work Environment Ordinance, on matters referred to in Chap. 2, Sections 1-8, Chap. 3, Section 2, 1st and 3rd paragraph, Section 2a, 1st paragraph and Sections 3-4 or Chap. 4, Sections 1-4 and 8 of the Work Environment Act.

Whatever is laid down in the said stipulations concerning employers and employees shall also apply to them.

### **Section 3**

For the purposes of these Provisions, the following terms and definitions shall apply.

Building work environment co-ordinator	The person appointed, pursuant to Chap. 3, Section 6 (1) of the Work Environment Act, to serve as building work environment co-ordinator with duties as provide in Chap. 3, Section 7 a and/or 7b of the same Act (planning and projection, and/or execution).
Passing vehicular traffic	Vehicular traffic passing by or through a place or zone where building or civil engineering work is in

progress. Vehicular traffic is also taken to include track-bound traffic. Passing vehicular traffic is not, on the other hand, taken to include traffic at the site or in the zone which is connected with the building or civil engineering work.

Safety nets	Nets, including suspension devices, designed and made to capture falling persons.
Client's delegee	The person (legal or natural) who, pursuant to Chap. 3, Section 7 c of the Work Environment Act, has the commission to exercise the client's work environment responsibility instead of the client.

### **Basic provisions of the Work Environment Act**

#### **Section 4**

The Work Environment Act contains basic provisions on the following and other matters.

- The liability of the party commissioning building or civil engineering work.
- The liability of a party involved in planning and design.
- The liability of a building work environment co-ordinator.
- The possibility of a party commissioning building or civil engineering work transferring their responsibility for the work environment to a client's delegee and the conditions for such transfer being valid.
- In consumer relations, the automatic reversion, in certain cases, to a client's delegee of the liability for the work environment devolving on a party commissioning building or civil engineering work.
- Co-operation between the party commissioning building or civil engineering work and the party conducting other activity, when the two activities are conducted on a joint worksite.

### **Liability of the party commissioning building or civil engineering work**

#### **Section 4 a**

The provisions of Sections 5-9, below, concerning the party commissioning building or civil engineering work shall instead, where relevant, apply to a client's delegee.

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### **Section 5**

The party commissioning building or civil engineering work shall, at every stage of planning and design, see to it that special consideration is paid to the work environment during the construction phase as regards

1. the positioning and design of the object or structure,
2. the choice of building products,
3. the choice of structures for foundation, framework systems or other load-bearing elements,
4. the choice and design of structure completion,
5. the choice of installations and their positioning, and
6. the choice of interior fittings.

### **Section 5a**

The party commissioning building or civil engineering work shall, at every stage of planning and design, see to it that special consideration is paid to the work environment during the construction phase in the following respects.

1. The construction time and the times allowed for sub-stages shall be ample enough for the work to be done at a pace whereby the risk of ill-health and accidents is averted.
2. Transport of building materials, demolition spoil and equipment shall be possible in a manner acceptable from the point of view of the work environment.
3. The establishment area shall normally be large enough for the offices, personnel facilities etc., needed for all activity on the construction site to be accommodated without excessive congestion.

### **Section 5b**

The party commissioning building or civil engineering work shall see to it that planning and project preparation take place sufficiently in advance of the works for co-ordination of the works to be possible without work environment hazards occurring due to lack of time for co-ordination.

The party commissioning building or civil engineering work shall also comply with the following. Prior to demolition, rebuilding or renovation of an object or part of an object, the risks of health-endangering materials shall be taken into account, as well as the risk of the stability of the object or part of it being jeopardised while work is in progress. In particular where health-endangering materials are concerned, the presence of such materials in the ob-



ject shall be made clear before demolition work begins. If knowledge is unobtainable by any other means, sampling and, if necessary, analysis of the sample or samples shall be carried out.

#### **Section 6**

A building work environment co-ordinator shall be either

- a legal person with persons available possessing the training, competence and experience needed for properly discharging the duties incumbent on the building work environment co-ordinator under the Work Environment Act and Provisions issued pursuant to the same,

or

- a natural person possessing, or having persons available who possess, the training, competence and experience needed for properly discharging the duties incumbent on the building work environment co-ordinator under the Work Environment Act and Provisions issued pursuant to the same.

The party commissioning building or civil engineering work shall be able to substantiate the qualifications as aforesaid on the part of the building work environment co-ordinator he has appointed, as well as on the part of the personnel whom the co-ordinator proposes to employ for the work of co-ordination. The same applies if the party commissioning building or civil engineering work has appointed himself to be building work environment co-ordinator.

In the work of co-ordination, the building work environment co-ordinator may only employ, among the persons at his disposal, those having the qualifications as aforesaid.

#### **Section 7**

The party commissioning a building or civil engineering work shall, prior to the commencement of the work, tender prior notice to the Work Environment Authority concerning construction sites

- where work is expected to last for more than 30 working days and where more than 20 persons will on any occasion be employed simultaneously or
- where the total number of person-days is expected to exceed 500.

Prior notice shall contain particulars according to App. 1.

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A copy of the prior notice shall be clearly displayed at the construction site and, if necessary, the notice shall be regularly updated. The party commissioning building or civil engineering work is responsible for this being done.

If the party commissioning building or civil engineering work fails to submit prior notice according to App. 1, in contravention of the requirements of the first paragraph of this section, this party shall pay a sanction charge of SEK 5 000, see Section 101.

#### **Section 8**

The party commissioning a building or civil engineering work shall ensure that a work environment plan (safety and health plan) is drawn up and is available before the construction site is set up, if

- any of the works indicated in Section 12 a (2) C needs to be carried out in connection with the building or civil engineering work or
- the work is of such extent that prior notice is mandatory under Section 7.

He shall further ensure that all such adjustments are made to the work environment plan as may be needed, having regard to the manner in which the work progresses and to any changes which have occurred.

Further stipulations concerning the work environment plan are contained in Sections 12, 12a and 14.

If the party commissioning building or civil engineering work has failed to ensure the drawing up of a work environment plan before the setting up of the construction site, in contravention of the requirements of this section, this party shall pay a sanction charge of

- SEK 50 000 if the size of the project is such that prior notification is required under Section 7 of these provisions,
- SEK 10 000 if the size of the project is such that prior notification is not required under Section 7 of these provisions.

No sanction charge shall be paid if the entire building or civil engineering work takes place over a maximum of two days in succession. See Section 101.

#### **Section 9**

The party commissioning a building or civil engineering work shall ensure the compilation of documentation having the content indicated in Section

12 b. He shall make or have made all adjustments to the documentation which may come to be needed, having regard to the manner in which the work progresses and to any changes which have occurred during the construction phase. He shall preserve the documentation for the lifetime of the object. If the object is disposed of, the documentation shall be transferred to the new tenant or owner.

**Responsibilities of certain other parties with safety responsibilities during planning, design and project preparation**

**Section 10**

Those involved in planning and design shall also, within the scope of their assignments and in relevant respects, comply with the prescriptions of Sections 5-5 b concerning the party commissioning a building or civil engineering work.

**Section 10 a**

The manufacturer of prefabricated buildings or structures shall in the course of the design comply with the relevant stipulations of Section 5.

**Responsibilities of a building work environment co-ordinator appointed for planning and design**

**Section 11**

The building work environment co-ordinator as referred to in Chap. 3, Section 7a of the Work Environment Act shall participate in the planning and in the direction of the design. He shall co-ordinate the planning and the design with respect to the work environment, in such a way that the parties involved in the planning and design take account of each other's planning and solutions.

This shall be done in the manner necessary for the avoidance of risks of ill-health and accidents during the execution of the building or civil engineering work. The co-ordination shall also lead to the execution of different parts of the project and of structures, installations and suchlike not coinciding in time and space during the project execution stage in such a way as to entail a risk of ill-health or accidents.

**Section 12**

In the event of Section 8 requiring a work environment plan (safety and health plan) to be drawn up, the building work environment co-ordinator as referred to in Chap. 3, Section 7 a of the Work Environment Act shall compile

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or procure the compilation of such a plan before the construction site is set up.

If the building work environment co-ordinator as referred to in Chap. 3, Section 7 a of the Work Environment Act has failed to compile or procure the compilation of a work environment plan before the setting up of the construction site, in contravention of the requirements of this section, this party shall pay a sanction charge of

- SEK 50 000 if the size of the project is such that prior notification is required under Section 7 of these provisions,
- SEK 10 000 if the size of the project is such that prior notification is not required under Section 7 of these provisions.

No sanction charge shall be paid if the entire building or civil engineering work takes place over a maximum of two days in succession. See Section 101.

#### **Section 12 a**

The work environment plan (safety and health plan) shall always include the points indicated in A and B, below. If works as referred to in C, below, are to be carried out, a description of preventive measures shall also be prepared, as indicated in C. Other activity which will be proceeding simultaneously at the construction site shall be taken into account in the plan as indicated in D.

Thus the work environment plan shall contain the following.

- A. The rules to be applied on the construction site.
- B. A description of how health and safety work shall be organised.
- C. When works as per 1-13, below, are involved: a description of the special measures to be taken during the construction phase in order for the work environment to meet the requirements of the Work Environment Act and its stipulations, as well as these Provisions and the other Provisions issued by the National Board of Occupational Safety and Health or the Work Environment Authority by authority of the Work Environment Ordinance and applicable to the work.
  1. Work entailing a risk of falls to a lower level where the difference in level is two metres or more.
  2. Work entailing a risk of burial under earth falls or engulfment in loose soil.
  3. Work with chemical or biological substances constituting a particular danger to safety and health or, according to Provisions issued by the National Board of Occupational Safety and Health or the

Work Environment Authority, involving a legal requirement for medical supervision.

4. Work which exposes the workers to ionising radiation requiring the designation of controlled or supervised areas as provided in the Provisions of the National Institute for Radiation Protection (SSI FS 1998:3) on the categorisation of workers and worksites in connection with activity with ionising radiation.
  5. Work near high voltage power lines.
  6. Work entailing the risk of drowning.
  7. Work on wells and tunnels and on underground works.
  8. Work carried out underwater with diving equipment.
  9. Work carried out in a caisson with a compressed-air atmosphere.
  10. Work involving the use of explosives.
  11. Work involving the launching, assembly and dismantling of heavy prefabricated components or heavy shuttering elements.
  12. Work in a place or area with passing vehicular traffic.
  13. Demolition of load-bearing structures or health-endangering materials or substances.
- D. If the work is to be carried out on a site where other activity will be in progress simultaneously, account shall be taken of this in the plan.

#### **Section 12 b**

The building work environment co-ordinator as referred to in Chap. 3, Section 7a of the Work Environment Act shall compile the documentation referred to in Section 9. The documentation shall be completed when the works have been concluded. It shall describe the structure and design of the object and the building products used, in all respects to the extent of importance for safety and health in connection with work on the operation, maintenance, repair, alternation and demolition of the object.

#### **Responsibilities of building work environment co-ordinators for the execution of building or civil engineering work**

##### **Section 13**

A building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act shall take part in the planning of the work and shall see to it that work environment viewpoints of common concern are taken into account in the selection of working methods and working equipment and when the various works are being jointly planned and when time-tabling is effected.

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### **Section 14**

A building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act shall organise safety activities on the construction site. If two or more undertakings are engaged in activities on the construction site, he shall organise joint safety activities together with them.

A building work environment co-ordinator as referred to in Chap. 3, section 7 b of the Work Environment Act shall see to it that the work environment plan (safety and health plan), drawn up according to Sections 8, 12 and 12 a, is kept available on the construction site so that everyone working there can view it as soon as the construction site is set up.

A building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act shall make or have made all adjustments to the work environment plan which may be needed, having regard to the manner in which the work progresses and to any changes which have occurred. In doing so the building work environment co-ordinator shall adapt the plan to the working methods actually used and to the actual conditions governing the conduct of the work. The description of how health and safety work shall be organised must also be kept up to date. A fresh adjustment is to be made in connection with all significant changes in the conduct of the work or changed conditions with a bearing on the work environment.

A building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act shall make or have made all adjustments to the documentation referred to in Section 12 b which may be needed, having regard to the manner in which the work progresses and to any changes which have occurred.

If the building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act fails to ensure that the work environment plan, drawn up according to Sections 8, 12 and 12 a, is kept available on the construction site so that everyone working there can view it, in contravention of the requirements of the second paragraph of this section, this party shall pay a sanction charge of

- SEK 50 000 if the size of the project is such that prior notification is required under Section 7 of these provisions,
- SEK 10 000 if the size of the project is such that prior notification is not required under Section 7 of these provisions.

No sanction charge shall be paid if the entire building or civil engineering work takes place over a maximum of two days in succession. See Section 101.

**Section 15**

A building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act shall supervise measures to verify that technical devices are duly inspected and tested and also that drivers of such devices have sufficient competence or, where applicable, the requisite permits.

**Section 16**

When no representative of the building work environment co-ordinator is available at the construction site, the building work environment co-ordinator shall see to it that particulars are available concerning whom to turn to. There shall be one or more contact persons, as the situation demands, and particulars shall be furnished as to how one of them can be contacted at any time when work is in progress.

**Co-ordination responsibilities of other undertakings at the construction site**

**Section 17**

The party carrying on activity at the construction site shall furnish the building work environment co-ordinator as referred to in Chap. 3, Section 7 b of the Work Environment Act with particulars of the risks which the activity may give rise to. All persons active at the construction site shall comply with the rules of order and safety which are issued by the co-ordinator and shall take part in the safety activities at the construction site.

**Section 18**

The persons carrying on activities at the common worksite shall help to maintain good order and to ensure that the construction site is not unnecessarily encumbered with materials, equipment, packaging, refuse and suchlike. Cleaning shall be carried out periodically.

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### **Planning and setting up of a place or area for building or civil engineering work**

#### **General**

##### **Section 19**

In the planning of building or civil engineering work, account shall be taken of all factors of any importance for safety and health (the work environment). Health hazards and accident risks involved by the work shall be assessed as early as possible. Particular account shall be taken of the risk of fire breaking out and spreading.

When choosing the location of workstations, it shall be borne in mind how access to these workplaces is obtained and how routes for communication and access can be arranged.

##### **Section 20**

Stores, depots, workshops and personnel facilities shall be located in such a way that the activity can be conducted under healthy and safe conditions.

The workers shall be provided with drinking water near the work stations.

##### **Section 21**

The work shall be planned so that different activities do not coincide in time and space in a way that risks of ill-health or accidents occur. The period allocated for different types of work and work stages shall be adapted to progress made on the site.

##### **Section 22**

If the work is to be carried out near water or near a high voltage power installation, protection shall be provided against the special risks which this can entail.

Existing overhead electric power lines which can constitute a risk to health or safety shall, if possible, be redirected away from the construction site or the current cut off. If this is not possible, barriers and notices shall be put up to ensure that equipment and vehicles are kept at such a distance that the overhead electric power lines will not endanger health or safety.



**Section 23**

A place or area where building or civil engineering work is carried on shall be demarcated in such a way as to be clearly visible and identifiable.

Signs shall be erected in suitable locations round a construction site and in its immediate vicinity.

**Installations, cables or other distribution systems for electricity, gas and water**

**Section 24**

Before building or civil engineering work begins, an investigation shall be made to ascertain whether there are installations, cables or other distribution systems in the ground or in existing parts of a building or structure which can be affected by the works. Such items shall be identified, inspected and clearly marked so that the risks associated with them will be reduced to a minimum.

**Section 25**

An installation for electricity, water, gas and suchlike shall be constructed so that it can be safely used throughout the project execution stage. Any such installations shall be designed and located so as to be protected from inadvertent influence.

**Reception and storage spaces**

**Section 26**

Sufficient space shall be provided, to the extent necessary, for the reception, storage and safe keeping of building products and other materials used in the work. An area for the keeping of dangerous substances shall be demarcated and laid out in such a way that health hazards and accident risks are averted.

Areas and surfaces for reception or storage shall have sufficient bearing capacity and stability to avert the risk of collapses.

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### **Evacuation**

#### **Section 27**

It shall be possible for all workstations to be evacuated in the event of fire, escaping gas or any other danger. All employees shall be able to reach a safe area quickly and safely.

#### **Section 28**

The number, distribution and dimensions of escape routes shall be adapted to the use, equipment and dimensions of the construction site, spaces and work premises and to the maximum number of persons that may be present.

Specific escape routes and assembly points shall be marked with signs. The signs shall be sufficiently resistant and be placed at appropriate points.

Escape routes requiring illumination shall be provided with emergency lighting of adequate intensity in case the ordinary lighting fails.

#### **Section 29**

Escape routes, together with communication routes and doors leading to them, shall be free from obstruction so that they can be used at any time without inconvenience.

#### **Section 30**

Doors for evacuation shall open outwards in the evacuation direction. They must not be so locked or fastened that they cannot be easily and immediately opened by any person who may require to use them in an emergency.

Doors and gates on escape routes shall be appropriately marked.

Sliding or revolving doors must not be used as doors on specific escape routes.

### **First Aid**

#### **Section 31**

First aid shall be available. Staff trained to provide first aid shall be available if called upon, at any time. Areas or places for first aid shall be provided to the extent appropriate to the nature and scale of the activity. Equipment and areas or places for first aid shall be signposted.

The addresses and telephone numbers of ambulance and rescue services shall normally be clearly displayed.

**Fire prevention. Fire detectors and alarm systems**

**Section 32**

The occurrence and spread of fire shall be prevented. Fire-fighting equipment and, where needed, fire detectors and alarm systems shall be provided. Their number and design shall be adapted to:

- the conditions where the building or civil engineering work is carried out,
- the size and use of the spaces,
- the equipment used,
- the physical and chemical properties of the building products and substances occurring, and
- the maximum potential number of people present in the spaces and work premises and on the construction site.

Appropriate tests and drills shall take place at regular intervals.

**Section 33**

Non-automatic fire-fighting equipment shall be simple to use and easily accessible. The equipment shall be indicated by signs.

**Doors, gates, windows and walls**

**Section 34**

Sliding doors shall be fitted with a safety device to prevent them from being derailed and falling over. Doors and gates opening upwards shall be fitted with a mechanism to secure them against falling back.

**Section 35**

Mechanical doors and gates shall operate without any risk of accident to the employees. They shall be fitted with emergency stop devices which are easily identifiable and accessible and, unless they open automatically in the event of a power cut, it shall be possible for them to be opened manually.

In the immediate vicinity of gates intended for vehicle traffic, there shall be doors for pedestrian traffic unless it is safe for pedestrians to use the gates. Such doors shall be clearly marked and kept free at all times.

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### **Section 36**

Windows, skylights, ventilators and smoke lids shall be possible to open, close, adjust and secure in a safe manner. When open or unlocked, they must not constitute a hazard to the employees. Windows and skylights shall be designed for such equipment or otherwise fitted with devices allowing them to be cleaned without risk to the persons carrying out this work or to other employees.

### **Section 37**

Walls of glass or other transparent or translucent material in the vicinity of workplaces or of access or communication routes shall be clearly indicated. They shall be made of shatter-proof material or be shielded to prevent employees from coming into contact with them or being injured should the walls shatter.

## **Communication routes**

### **Section 38**

A construction site shall be sufficiently provided with safe communication routes, loading bays, loading towers and load openings.

Communication routes, loading bays, loading towers and load openings shall have such protective devices and shall be designed, proportioned and located in such a way as to avert the risk of falls and falling objects. Loading towers shall normally have a gate or barrier which can be easily and safely opened and closed in connection with transport operations. Loading bays shall have at least one exit point.

Communication routes shall, depending on the equipment on the construction site and other conditions there, be clearly marked if necessary for the safety of the employees.

### **Section 39**

Communication routes to a higher or lower level shall normally consist of stairs or a ramp. If the difference in height between two levels exceeds ten metres and this means a great deal of stair-climbing for the employees, a lift shall be available in addition to the stairs.

Stairs shall be of sufficient width and shall have a suitable gradient. If needed, having regard to the height of the stairs, there shall be landings at

suitable distances. Stairs and landings shall have, respectively, handrails and guardrails.

A permanently fixed ladder which is vertical or near-vertical and more than six metres in length shall have cage protection down to a height of about two and half metres above ground or another level.

**Section 40**

Communication routes intended for use by motor vehicles shall be designed with due regard for traffic safety.

Communication routes intended for motor vehicles shall, for the protection of others at the site, be provided with sufficient safety clearance or adequate protective devices.

**Section 41**

Sufficient clearance shall be allowed between vehicle traffic routes and doors, gates, passages for pedestrians, corridors and staircases.

**Lighting**

**Section 42**

Work stations and other spaces, together with communication and access routes, shall as far as possible be arranged so as to receive sufficient daylight.

Where daylight is insufficient, artificial lighting shall be provided. Moveable, impact-proof workplace lighting shall be used if needed.

Suitable standby lighting shall be provided if needed.

**Section 43**

Spaces, workstations and communication and access routes where employees are especially exposed to risks in the event of power cuts shall be provided with emergency lighting of adequate intensity.

**Section 44**

Lighting installations shall be of such a kind and positioned in such a way as to entail no risk of accident to the employees.

The colour of artificial light used must not alter or affect the perception of signals, signposts or warning clothing.

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### **Conduct of the work**

#### **Choice of working methods and equipment**

##### **Section 45**

For the conduct of the work, such working methods and equipment shall be chosen as

- counteract accidents due to falls or collapses, overturning or falling objects,
- serve to avoid physical loads which are dangerous to health or are unnecessarily fatiguing,
- are appropriate to the properties of the building products,
- entail low exposure to noise, vibrations, dangerous substances and air contaminants, and
- are suitable for structural work on foundations and framework systems and for the assembly of framework supplements, installations and interior fittings.

##### **Section 46**

Suitable equipment shall be provided for lifting and conveying building products and other material, if needed in order for the employees not to be subjected to loads which are dangerous to health or unnecessarily fatiguing.

The lifting devices and accessories chosen, including their component parts, attachments, anchorings and supports, shall be properly designed and constructed and sufficiently strong for their intended use, and shall clearly display their maximum load values.

Lifting devices and accessories shall be operated by qualified workers who have received appropriate training, and may not be used for other than their intended purposes.

##### **Section 47**

Such equipment, including hand tools whether power-driven or not, installations and machinery shall be chosen which are properly designed in accordance with ergonomic principles. They may only be operated by employees with adequate skills and may be used solely for the purpose for which they were designed.

Shutterings and temporary support shall be designed, installed and maintained so as to safely withstand any loads and stresses which they may be exposed to.

Vehicles powered by internal combustion engines, as well as machinery and other equipment, which can be used in such a way that the persons operating them or working near them are not exposed to exhaust fumes in harmful concentrations, shall be selected.

**Instructions, inspection, etc.**

**Section 48**

Information concerning the building or civil engineering work, concerning the rules to be applied and concerning health and safety measures (work environment) taken or planned shall be supplied to the employees.

Information concerning the safe conduct of the work shall be supplied to the employees to the extent necessary.

Information and instructions shall be comprehensible to the employees concerned.

**Section 49**

Equipment and installations procured for and used in the work shall be checked before use. Equipment and installations in use shall be checked and maintained periodically and after events which may have affected their working order. This applies particularly to the following:

- Fire-fighting equipment, fire detectors and alarm systems.
- Energy distribution installations.
- Communication routes.
- Traffic control devices and cut-off devices.
- Shutterings and other temporary structures.
- Safety nets.
- Structures for workplaces at a height or depth.
- Signage, markings and other safety and/or health signs.

**Section 50**

If the inspection as provided in Section 49 reveals deficiencies which can imply serious danger to safety or health, the work shall be suspended immediately. The work may not be resumed until the deficiencies have been remedied.

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### **Section 51**

Launching, assembly or dismantling of heavy prefabricated elements or heavy shuttering elements may only be commenced and carried out under the direction of a competent person.

### **Pointed or sharp objects**

#### **Section 52**

Projecting or upward-pointing building parts or objects which are pointed or sharp shall be removed or shielded if needed for the avoidance of accidents.

### **Transport of building products or other material**

#### **Section 53**

The transport of building products or other materials shall be planned and conducted in such a way that ill-health or accidents are prevented.

Transport up to or down from a level more than two metres above ground level or the equivalent shall be conducted in such a way that a guardrail or other protective device does not need to be removed, or else:

- via loading towers,
- via load openings in façades,
- via specially provided ramps or
- via specially provided transport systems.

If, due to the shape or size of individual objects, the transport cannot be conducted in accordance with subsection 2, a guardrail or other protective device may be removed. If so, the transport shall be especially planned and supervised. Special safety precautions shall be taken. The guardrail or protective device shall be put back as soon as it no longer impedes the transport operation. This also shall be specially supervised.

### **Handling of waste**

#### **Section 54**

Sufficient possibility shall be provided of separating, storing and removing building and demolition waste.

Storage and handling or removal of building and demolition waste shall take place in a safe manner. Special attention shall be paid to conditions when



used dangerous material and used dangerous substances or packaging having contained dangerous substances is removed from the site or the area.

**Storage and depositing of materials**

**Section 55**

Building products, other material and equipment which may move in any way and could cause occupational accidents or ill-health, shall be stabilised in an appropriate and safe manner.

**Section 56**

When building products and other material are deposited on a roof or in other places at a height, the impact of wind shall be taken into account. The impact of wind shall also be taken into account in connection with the storage and deposition of any material with large areas. Anchorings and other stabilizing measures shall always be designed and proportioned to the wind loads occurring.

**Falls to a lower level etc.**

**Section 56 a**

The stipulations of Sections 57–60, Sections 87–92 and other applicable rules shall be followed when work involving a risk of falling is carried out. A sanction charge may be applied if fall protection fails to meet the minimum level described in Section 60 a.

**Section 57**

The risk of the employee falling to a lower level shall be prevented. Guardrails, work platforms, work baskets or scaffolding shall be used if needed.

Guardrails shall be of appropriate strength and height and shall have at least a toeboard, a principal guardrail and an intermediate guardrail or afford corresponding protection. Guardrails shall be completely enclosed if loose objects occur which may cause injury when falling through the guardrails.

**Section 58**

If, owing to the nature of the work, guard rails or equipment mentioned in Section 57 cannot be used, personal fall protection equipment shall be used. If needed, an access route to the risk area shall be suitably arranged if needed. If unauthorised employees can enter the risk area, it shall be demarcated and closed off.

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### **Section 59**

Openings and holes in floors, roofs or suchlike where there is a risk of falls or trampling down, shall without delay be provided with a guardrail or protective covering, which cannot be disturbed inadvertently. A protective covering shall have sufficient load-bearing capacity and shall either be designed so as to make its purpose evident or else be clearly marked.

### **Section 60**

A surface which can be trodden on shall normally have sufficient load-bearing capacity and surface roughness, to prevent personnel from treading through it or falling. Workplace floors must not have any dangerous bumps, holes or slopes.

Surfaces which do not have ample load-bearing capacity or which are slippery shall be closed off and marked except where manifestly unnecessary.

If a surface which does not have ample load-bearing capacity or which is slippery needs to be trodden on, special safety precautions shall be taken which make it possible for the work to be done in a safe manner.

### **Sanction charges for risks of falls to a lower level etc.**

#### **Section 60 a**

If fall protection under Sections 57–60 is not present and work is carried out in a location where there is a risk of falling and the height of the fall is two metres or more, a sanction charge shall be paid unless the minimum conditions below are fulfilled. In case of work on roofs the stipulations of Sections 86 a and 92 a are also applicable.

1. Protection to prevent falls during work shall be present by means of that
  - a. work is carried out within the protection of guardrails,
  - b. work is carried out on mobile or fixed work platforms,
  - c. work is carried out in suspended work baskets or other types of work baskets,
  - d. work is carried out on or within scaffolding with guardrails,
  - e. work is carried out above or within safety nets, or
  - f. personal fall protection equipment is used.

2. Protection to prevent falls shall be designed and used as described in a-e below.

a. *Guardrails* shall have a toeboard, an intermediate guardrail and a principal guardrail, and shall be at least one metre high. The stipulations in the regulations relating to scaffolding shall be met when guardrails only provide protection against falling from working decks in a scaffold. If permanent guardrails are used as fall protection, the toeboard may be omitted.

b. *Openings and holes where there is a risk of falls* shall be provided with a protective covering or guardrails.

c. *Personal fall protection equipment* shall consist of a full body harness and connecting lanyard with energy absorber. The lanyard shall be anchored.

d. *Personal fall protection equipment* shall prevent falls to a lower level.

e. *Personal fall protection equipment* shall be used and be anchored when moving along a ladder or ladders, fixed or unfixd, if the height difference between the level where moving begins and the level where it ends is more than 4 metres.

3. Exceptions to 1 and 2 are permitted for the following work.

a. When *working from an unfixd ladder*, personal fall protection equipment does not need to be used if all the conditions in the points below are met

- only occasional tasks are being carried out,
- the ladder is less than 5 metres long,
- the work takes less than 15 minutes per each putting up of the ladder, and
- the work can be done with one hand, and so that the worker holds onto the ladder with the other hand.

b. During *occasional tasks involving installing an anchor device for a safety lanyard* a maximum of 7 metres above ground level. Existing anchor devices along the route up shall be used, if such are available.

c. When working with *securing a safety lanyard for the first time* to an existing anchor point for fall protection equipment no more than 7 metres above ground level. Existing anchor devices along the route up shall be used, if such are available.

Any employer, any person running a business without employees alone or together with a family member, anyone who runs such a business jointly or

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anyone who employs hired labour for their business and fails to meet the requirements of the first, second, third or fourth paragraphs of this section shall pay a sanction charge, see Section 101.

The minimum sanction charge is SEK 40 000 and the maximum sanction charge is SEK 400 000 . For anyone with 500 or more people employed, the sanction charge is SEK 400 000 . For anyone with fewer than 500 people employed, the sanction charge shall be calculated as follows:

Sanction charge = SEK 40 000 + (number of people employed - 1) x 721.

The total shall be rounded down to the nearest whole hundred.

Anyone who also fails to comply with Section 92 a for the same work shall pay only one sanction charge.

### **The work stations**

#### **Section 61**

Work stations, wherever located shall be of appropriate strength and stability having regard to

- the largest potential number of employees present in them,
- any other loads which they shall be capable of supporting and how these loads are distributed, and
- any other influence which they may be subjected to during use.

The stability and strength of work stations shall be checked in a suitable manner and especially, in cases where work stations can be raised or lowered, after every raising or lowering of them.

#### **Section 62**

A space where work is to be done shall have sufficient surface area and height to allow the employees to perform their work without risk to their safety, health or well-being.

The stipulations of the 1st paragraph do not apply to work in existing buildings or structures if, for technical reasons, the requirements of sufficient surface area and height cannot be met. In such cases, the risk of ill-health or accidents shall be prevented by using technical aids or by organisational measures.

**Section 63**

There shall be an access route to the work station. Access routes shall give easy, safe and appropriate access. They shall have such protective devices and be so designed, dimensioned and located that the risk of falls and collapses, overturning or falling objects will be averted.

**Climate and air quality**

**Section 64**

For work indoors, the thermal climate shall be appropriate. It shall be adapted according to whether the work is light or heavy and whether it is mobile or sedentary.

Windows shall if necessary have a device or design capable of excluding solar radiation.

For work outdoors, the employees shall be protected against atmospheric influence which can be detrimental to their health and safety.

**Section 65**

The air quality in work stations shall be satisfactory. Air change shall be arranged according to the working methods used and the physical demands on the employees. If mechanical ventilation is used, this shall be kept in good working order and must not expose the employees to unpleasant draughts.

Where necessary for the sake of the employees' health, any malfunctions in the installation shall be indicated by a control system.

**Special risk areas**

**Section 66**

Appropriate safety precautions shall be taken to protect the employees against risks

- caused by stability and load-carrying capacity not being fully developed at various phases during the project execution stage or
- arising from the temporary fragility or instability of a structure.

**Section 67**

Areas where there is a risk of falling objects shall be closed off and marked. If such areas have to be entered, protective roofs, covered passageways or suchlike shall be provided.

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### **Section 68**

Before an employee enters a space or an area

- where air contaminants, oxygen deficiency or other atmospheric conditions may occur which are capable of causing danger or
- where the air may be readily ignitable

the air shall be checked and suitable measures taken. Special account shall be taken of the need for suitable protective equipment.

### **Section 69**

Employees working in a confined space

- where air contaminants, insufficient oxygen level or other air conditions may entail serious danger or
- where the air may be readily ignitable

shall at all times be able to be watched from outside. All appropriate precautions shall be taken to ensure that they can be assisted quickly and effectively.

### **Section 70**

If the site includes limited-access areas, these shall be equipped with devices to prevent unauthorised employees from entering. Appropriate measures shall be taken to protect employees who are authorised to enter these danger areas. The danger areas shall be clearly signposted.

## **Personal protective equipment**

### **Section 71**

A safety helmet with chin straps and safety shoes with penetration-resistant soles and toe caps shall be worn except where manifestly unnecessary.

For work on ice-covered water, ice prods, ice crampons, a life jacket and life line shall be available.

Personal protective equipment shall otherwise be used when needed.

## **Certain particular kinds of work**

### **Earthwork**

#### **Section 72**

Earthwork shall be planned and conducted in such a way that the stability of the ground will be sufficient, having regard to the loads to which it may come to be subjected. The risk of collapses, landslips, bottom heaves or other unplanned changes in the ground, as well as the risk of flooding, shall be prevented.

#### **Section 73**

Before excavation starts, an investigation shall be made concerning the presence in the ground of

- materials dangerous to health,
- substances dangerous to health or
- installations, cables or other distribution systems.

If this is the case, the requisite safety precautions shall be taken.

#### **Section 74**

Supportive structures shall be used in connection with excavation, unless the risk of a collapse endangering health or safety is judged non-existent. Alternatively the excavation may be carried out with a slope gradient.

Supportive structures or slope gradients shall be designed so as to provide sufficient security against collapses or other unplanned changes in the ground, having regard to the loads occurring. Excavated material, other materials and moving vehicles shall be kept away from the excavation.

#### **Section 75**

Excavated material and other materials shall be positioned so that they do not cause

- risks due to collapses, falling stones and suchlike or
- overloading of sheet piling and props and struts.

If there is a risk of injury resulting from falls into excavations and wells, these shall be provided with protective covering or closed off by guardrails.

Preventive measures shall be taken to ensure that excavating and material-handling vehicles and machinery will not fall into the excavations or into water.

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### **Section 76**

Excavation may only be started and carried on under the direction of a competent person

- if investigation as provided in Section 73 reveals the presence of materials or substances dangerous to health, installations, cables or other distribution systems, or
- if, as provided in Section 74, supportive structures need to be used or alternatively excavation is carried out with a slope gradient.

### **Cofferdams and caissons**

#### **Section 77**

Cofferdams and caissons shall be

- designed according to the loads they can be subjected to and made of appropriate, solid materials of adequate strength,
- appropriately equipped so that the employees can gain shelter in the event of an irruption of water or materials.

The construction, installation, transformation or dismantling of cofferdams and caissons must take place only under the supervision of a competent person.

Cofferdams and caissons shall be inspected by a competent person at regular intervals.

### **Demolition work**

#### **Section 78**

Before demolition work is started, an investigation shall be carried out to ascertain whether materials or substances dangerous to health are included in the building or civil engineering works. If so, this shall be taken into account when planning the demolition.

#### **Section 79**

Demolition of load-bearing structures or demolition involving materials or substances dangerous to health may only be planned and undertaken under the direction of a competent person. That person shall keep the work under continuous observation and supervision.



**Section 80**

Demolition and holing shall be carried out in such a way that the strength and stability of remaining parts of the building or civil engineering works are not endangered. Building parts constituting support for other parts may not be demolished until sufficient anchoring or bracing has taken place. If a risk of collapse, overturning or falling objects arises during the work, the danger area shall immediately be evacuated and closed off.

In the case of demolition

- by excavator or mobile crane, or
- by ball fitted to the arm of the excavator or to the crane rope,

the machine operator shall be closely familiar with this method of working.

In the case of demolition by blasting the work shall be described in a blasting scheme.

**Passing vehicular traffic**

**Section 81**

Building and civil engineering work shall be planned, arranged and undertaken so as to afford adequate safety against ill-health and accidents from passing vehicular traffic.

Risks due to passing vehicular traffic shall be prevented. To this end consideration shall primarily be given to the measures indicated in a-c, below, in the order given.

- a) The traffic is diverted so that the work will not be affected.
- b) The traffic is directed in such a way that vehicles pass by at a safe distance.
- c) The traffic is segregated from the worksite by means of traffic control devices. Protective devices effectively excluding or diverting traffic from the worksite shall also be provided to the extent necessary.

The following measures shall also be considered, either separately, combined with each other or combined with the measures in (b) and (c).

- d) The speed of traffic past the worksite is reduced by means of road signs, road markings or some other appropriate measure.
- e) The traffic is directed past the worksite by a specially appointed person (a signalman) or by means of traffic signals.

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Traffic control devices and protective devices shall be positioned and weighted or anchored in such a way that they cannot normally be ejected into the worksite by passing vehicles.

#### **Section 82**

In applying Section 81 to work in a track area with track-bound traffic passing by, special care shall be taken to ensure that the work is planned, arranged and undertaken so as to offer adequate safety against ill-health and accidents from this traffic.

#### **Section 83**

If a vehicle must pass through the place where the work is being undertaken and the employees, for safety reasons, must therefore leave their work stations, measures shall be taken to ensure that the employees have left the risk area when vehicles pass.

#### **Section 84**

Special protective devices shall if needed be provided which prevent the employees from being exposed to noise, vibrations or air pollution from passing vehicular traffic. Account shall also be taken of the need for protection from light and reflections.

#### **Section 85**

High visibility clothes with reflectors shall be worn for the following tasks and in the following situations:

- a) The worksite is not segregated from passing vehicular traffic by protective devices effectively excluding or diverting the traffic from the worksite (Section 81, 2nd paragraph (c)).
- b) Work as a signalman at a worksite as referred to in Section 81, 3rd paragraph (e) or Section 83, with the task of directing the traffic and/or ensuring that the employees leave the danger area when a vehicle approaches.

#### **Section 86**

Work in the following cases may be started and undertaken only under the direction of a competent person.

- a) It is intended that risks due to traffic shall be prevented through measures referred to in Section 81, 2nd paragraph (c).
- b) The work is concerned with the repair and maintenance of track with passing vehicular traffic.

**Work on roofs**

**Section 86 a**

The stipulations of Sections 57–60, Sections 87–92 and other applicable rules shall be followed when work on roofs is carried out. A sanction charge may be applied if fall protection fails to meet the minimum level described in Section 92 a.

**Section 87**

In connection with work on roofs, special account shall be taken of the risk of accidents resulting from falls, treading through materials, slipping and tripping. The same applies concerning health hazards due to unsuitable work postures and working movements. In both cases, account shall be taken of the importance of climatic factors for work under the special conditions applying to work on roofs.

Materials and tools shall be placed on the roof in such a way that they cannot slide down. Material shall be appropriately secured if needed.

**Section 88**

A guardrail or equipment affording corresponding protection shall normally be used in connection with work on roofs. Permanently fitted equipment shall be used in the first instance.

If, having regard to the circumstances, it is not reasonable to use a guardrail or equipment affording corresponding protection, personal fall protection equipment shall be used. For assessment purposes, account shall be taken of the following:

- the time needed to fit the safety rail or the equipment and the risks associated with doing so,
- the duration of the roof work to be undertaken, and
- the risks associated with the work if the guardrail or corresponding equipment is not used.

**Section 89**

The stipulations of Section 88 need not be observed in connection with the replacement of single roof tiles or other similar temporary work on roofs, nor in connection with rooftop snow clearance. Personal fall protection equipment shall then be used.

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If personal protective equipment against falls from a height is used with a safety line, the safety line shall be secured to an appropriate device on the roof, e.g. a ridge rail. If a device for securing the safety line is lacking or if there are other special reasons, a person suitable for this task shall be detailed to hold the safety line steady, preferably anchored by turns around a structure. The safety line shall be kept stretched throughout the work.

In connection with snow clearance, a special person shall normally be detailed to hold the safety line fast anchored by turns around a structure and to ensure that it is stretched.

#### **Section 90**

In connection with work on roofs with more than a 1:4 (approx. 14°) gradient, a horizontal work surface shall be provided if the work is done in a small area and is expected to last for more than 4 hours.

#### **Section 91**

Before repair or maintenance work on a roof begins, the state of the roof shall be investigated, particularly as regards its load-carrying capacity and surface roughness.

#### **Section 92**

In the construction of roofs with self-supporting sheeting on roof beams, the weight of the sheeting packages shall be adapted to the load-carrying capacity of the roof. The packages shall be distributed on the roof at such spaces as to facilitate handling. The first sheets on the roof shall be laid from a scaffolding, work platform or other safe position. Each sheet shall be secured immediately after it has been laid out.

### **Sanction charges for work on roofs**

#### **Section 92 a**

If fall protection under Sections 87-89 is not present and work is carried out on roofs in a location where there is a risk of falling and the height of the fall is two metres or more, a sanction charge shall be paid unless the minimum conditions below are fulfilled. The stipulations of Sections 56 a and 60 a are also applicable to work on roofs.

1. Protection to prevent falls during work on roofs shall be present by means of that

- a. work is carried out within the protection of guardrails,
- b. work is carried out on mobile or fixed work platforms,
- c. work is carried out in suspended work baskets or other types of work baskets,
- d. work is carried out on or within scaffolding with guardrails,
- e. work is carried out above or within safety nets, or
- f. personal fall protection equipment is used.

2. Protection to prevent falls shall be designed and used as described in a-h below.

- a. *Guardrails* shall have a toeboard, an intermediate guardrail and a principal guardrail, and shall be at least one metre high. The stipulations in the regulations relating to scaffolding shall be met when guardrails only provide protection against falling from working decks in a scaffold. If permanent guardrails are used as fall protection, the toeboard may be omitted. Protective guardrails shall also be present on roof edges at gables.
- b. If work is only carried out *in a limited area of the roof*, it is sufficient for the fall protection to provide protection against falls in this area, if there is a clear and durable blocking or roping-off to prevent access to other parts of the roof where no work is taking place.
- c. *Openings and holes* in roofs or surfaces where there is a risk of falls shall be provided with a protective covering or guardrails.
- d. Areas on roofs or surfaces where there is *a risk of treading through* shall be blocked or roped-off.
- e. *Personal fall protection equipment* shall consist of a full body harness and connecting lanyard with energy absorber. The lanyard shall be anchored.
- f. *Personal fall protection equipment* shall prevent falls to a lower level.
- g. *Personal fall protection equipment* shall be used and be anchored when moving along a ladder or ladders, fixed or unfixed, if the height difference between the ground and the level where moving ends is more than 4 metres. When moving between different levels on roofs, personal fall protection equipment shall be used and be anchored even if the level difference is less than 4 metres.
- h. *Personal fall protection equipment* shall be used when moving on roofs and anchored continuously. This is not applicable if there are guardrails to protect against falls.

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3. Exceptions to 1 and 2 are permitted for the following work.

a. Work on *roofs with a pitch of no more than 6 degrees* when the work is carried out more than two metres from the roof edge or any other edge. Clear and durable blocking or roping-off shall be present which define the work area, at least two metres from the roof edge or any other edge. If the roof surface slopes outwards and the roof is so slippery that there is a risk of falling over the edge, this exception does not apply.

b. During *occasional tasks involving installing an anchor device for a safety lanyard* a maximum of 7 metres above ground level. Existing anchor devices along the route up shall be used, if such are available.

c. When working with *securing a safety lanyard for the first time* to an existing anchor point for fall protection equipment no more than 7 metres above ground level. Existing anchor devices along the route up shall be used, if such are available.

Any employer, any person running a business without employees alone or together with a family member, anyone who runs such a business jointly or anyone who employs hired labour for their business and fails to meet the requirements of the first, second, third or fourth paragraphs of this section shall pay a sanction charge, see Section 101.

The minimum sanction charge is SEK 40 000 and the maximum sanction charge is SEK 400 000. For anyone with 500 or more people employed, the sanction charge is SEK 400 000. For anyone with fewer than 500 people employed, the sanction charge shall be calculated as follows:

Sanction charge = SEK 40 000 + (number of people employed - 1) x 721.

The total shall be rounded down to the nearest whole hundred.

Anyone who also fails to comply with Section 60 a for the same work shall pay only one sanction charge.

### **Safety nets**

#### **Section 93**

A safety net shall be designed and constructed in such a way that

- it can arrest falling persons with adequate safety,
- a falling person arrested by the net will not be injured on coming into contact with it or with the suspension devices, and
- the capacity of the safety net for catching a falling person and arresting the fall is satisfactory throughout the net's total service life.

**Section 94**

When delivered, the safety net shall be accompanied by written instructions in Swedish. The instructions shall describe how the safety net is intended to be assembled, used and dismantled and how it is to be stored, cared for and inspected. The instructions shall also give warning of factors which may adversely affect the function of the net.

**Section 95**

In the case of a safety net provided with one or more test ropes for checking the net's condition, the instructions shall indicate

- the latest date when the test ropes are intended to be test-pulled and
- how the test results can be used for determining when the net no longer affords adequate protection.

For a safety net without any test rope, the instructions shall state the date after which the net no longer affords adequate protection.

**Section 96**

The accompanying instructions shall be taken into account when the safety net is used.

A safety net may only be assembled under the supervision of a competent person. In connection with assembly, the aim shall be to minimise the falling height. This may not exceed what the instructions show the net to be intended for. Nor must it exceed 6 metres.

The clearance under the net shall be sufficient for a person falling into the net not to be injured by contact with something underneath the net when the latter is stretched.

**Section 97**

A safety net which has caught a falling person or an object which may have imposed the corresponding stress on the net may only be used if it has subsequently been examined by a competent person who has assessed it to be still in working order.

**Section 98**

A safety net with one or more test ropes may, after the date when, according to the written instructions, a test rope is intended to be test-pulled at the latest, only be used if the following points have been observed:

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- (a) The test rope has been test-pulled.
- (b) An assessment of the test results in accordance with the instructions has shown that the safety net still affords adequate protection.
- (c) An assessment of the test results in accordance with the instructions has shown the safety net to afford adequate protection until the next test-pull. Alternatively, the date after which the net no longer affords adequate protection has been determined in accordance with the instructions.

Test-pulling, assessment and determination shall be carried out by a competent person.

#### **Section 99**

A safety net with only one test rope may not be used after the time determined as provided in Section 98 (c).

A safety net with more than one test rope may not be used after the point in time which, following test-pulling of the last test rope, has been determined as provided in Section 98 (c).

A safety net without a test rope may not be used after the date when, according to the written instructions, the net no longer affords adequate protection.

#### **Section 100**

For work in temperatures below -10°C, safety nets shall be chosen with material which retains its energy absorption capacity at the temperature concerned.

### **Provisions on sanction charges**

#### **Section 101**

The provisions in Sections 7, 8 and 12 and in the second paragraph of Section 14 are provisions under Chapter 4 (8) of the Work Environment Act (1977:1160). The provisions in Sections 60 a and 92 a are provisions under Chapter 4 (1) of the Work Environment Act.

Those who violate these provisions shall pay sanction charges according to Chapter 8 (5-10) of the Work Environment Act. The size of the sanction charge is calculated according to the grounds specified in Sections 7, 8, 12, 14, 60 a and 92 a.



**Entry into force**

These Provisions enter into force on 1st January 2000. The following Provisions and General Recommendations issued by the National Board of Occupational Safety and Health are repealed with effect from the same date:

1. Working Platforms for Slipform Casting (Notice 1973:12).
2. Construction Work (formerly Directions 32).
3. Safety Nets (formerly Directions 32:2).
4. Work on Roofs (AFS 1983:12).
5. Roadwork (AFS 1984:19).
6. Building and Civil Engineering Work (AFS 1994:52).

***Included amendments of the Provisions:***

- AFS 2000:24 which entered into force on 1 January 2001
- AFS 2007:11 which entered into force on 1 February 2008
- AFS 2008:16 which entered into force on 1 January 2009
- AFS 2009:12 which entered into force on 15 December 2009
- AFS 2014:26 which enters into force on 1 January 2015 (Sections 56 a, 60 a, 86 a and 92 a) or 1 July 2014 (all other sections)

The training requirement laid down in Section 6 is to be applied as from 1st January 2011.

**Guidance on the provision concerning entry into force**

Given the very large number of persons in need of training, it is judged reasonable for implementation of the training requirement laid down in Section 6 to be deferred for two years. This, however, does not imply any waiver of the requirement laid down in Chap. 3, Section of the Work Environment Act concerning the suitability of the building work environment co-ordinator.

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*App. 1*

**Prior notice to the Work Environment Authority**

1. Date of notice.
2. Location (visiting address) of the construction site.
3. Name, address and telephone number of the party commissioning the building or civil engineering work, together with the party's corporate registration number and contact person.
4. Type of project.
5.
  - a) Where applicable, the name, address and telephone number of the party to whom, pursuant to Chap. 3, Section 7 c of the Work Environment Act, the work environment responsibility devolving on the party commissioning building or civil engineering work has been assigned, together with the assignee's (client's delegee) corporate registration number and contact person.
  - b) The commencement date of the assignment and, if any, its completion date.
6.
  - a) Name, address and telephone number of the building work environment co-ordinator appointed, pursuant to Chap. 3, Section 6 of the Work Environment Act,
    - for planning and design (Chap. 3, Section 7 a of the Work Environment Act),
    - for the execution of the project (Chap. 3, Section 7 b of the Work Environment Act).
  - b) The corporate registration number and contact person of the building work environment co-ordinator.
  - c) The period of time for which the building work environment co-ordinator is appointed.

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7. Name, address and telephone number of the persons who have planned and designed the object, together with particulars of contact persons and corporate registration numbers.
8. Planned commencement date of work on the construction site.
9. Planned completion date of work on the construction site.
10. Estimated maximum number of persons (natural) who will be employed on the construction site on any single occasion.
11. Planned number of contractors and self-employed persons on the construction site.
12. Names, addresses and telephone numbers of the contractors already chosen, together with the corporate registration number of each of them and particulars of their contact persons.

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## **General Recommendations of the Swedish National Board of Occupational Safety and Health on the implementation of the Provisions on Building and Civil Engineering Work**

The following General Recommendations are issued by the National Board of Occupational Safety and Health on the implementation of its Provisions (AFS 1999:3) on building and civil engineering work.

General Recommendations have a different legal status from Provisions. They are not mandatory. Instead they serve to elucidate the meaning of the Provisions (e.g. by explaining suitable ways of meeting the requirements, giving examples of practical solutions and procedures) and to provide recommendations, background information and references.

### **Background**

#### **General**

Sweden has undertaken to transpose, among other instruments, EC Directives on the working environment to Swedish Provisions. The basic EC rules on safety and health at work are stated in a framework Directive: Council Directive of 12th June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (89/391/EEC).

A number of individual Directives within the meaning of the framework Directive state minimum requirements to be met by the EU Member States. The first of these individual Directives (89/654/EEC), referred to as the Workplace Directive, indicates requirements for the safe design of workplaces. Another individual Directive, the eighth, is the Council Directive of 24th June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites (92/57/EEC, "the Construction Sites Directive"). The Provisions on Building and Civil Engineering Work (AFS 1999:3) were intended, insofar as it was incumbent on the then National Board of Occupational Safety and Health, to effect a final transposition of the provisions of the Construction Sites Directive to Swedish law.

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Since, however, the European Commission, in a Letter of Formal Notice dated 4th April 2006, has criticised certain parts of Sweden's transposition of the Construction Sites Directive, both the Work Environment Act and AFS 1999:3 have been revised to bring Swedish law more closely into line with the Directive. As a first step (AFS 2007:11) the scope of the Provisions was clarified, without any amendment being needed to the Work Environment Act. The Act itself having since been amended, it was now possible for the other necessary amendments to be made to AFS 1999:3.

The amendments to the Work Environment Act comprise the addition to Chap. 3 of new provisions on building and civil engineering work, mainly to the following effect. The person who orders execution of building or civil engineering work (the client) shall, during each phase of the planning and design (previously this applied to design only), see to it that work environment viewpoints are taken into consideration and shall appoint one suitable building work environment co-ordinator for the planning and design of work and one for its execution. The Act sets forth the duties of the building work environment co-ordinators on essentially the same lines as the Construction Sites Directive, and it also makes clear that both the co-ordinators and the client are responsible for these duties being discharged. Duties relating to prior notice, the work environment plan and other documentation, however, are imposed through Provisions by statutory empowerment. The client's work environment responsibility can pass to a client's delegee basically a general contractor, but only if that party genuinely assumes tasks corresponding to the responsibility. The Work Environment Authority can transfer this responsibility between contractor and client if there is special cause for so doing. Further to this point, see the guidance on Section 4.

These Provisions now deal coherently and comprehensively with responsibility for the work environment in connection with project preparation and design, planning and the conduct of work, in all cases with specific reference to health and safety conditions (the working environment) in connection with building and civil engineering work. Needless to say, other Provisions issued by the National Board of Occupational Safety and Health and the Work Environment Authority may also be applicable to the conduct of building and civil engineering work.

### **To whom are the Provisions addressed?**

Many of the stipulations in the Provisions are not explicitly addressed to any particular party. Such address is only indicated in certain stipulations which

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carry direct penal sanctions or are otherwise of a more formal nature and in stipulations that are more exclusively directed to for example the client. The other stipulations employ such impersonal expressions as “a workplace shall be ...” or “protection shall be provided against ...”

This is the Board’s normal way of phrasing its Provisions. The main reason for using this method is that Provisions are normally addressed to so many different legal persons in positions of responsibility that a full enumeration in every stipulation would make the whole thing virtually unreadable.

The principle, therefore, is that, unless otherwise indicated, a stipulation is addressed to anyone who, under the Work Environment Act, may incur responsibility of the kind described. Most of the stipulations in this instrument, therefore, may therefore be presumed to be addressed to the following categories:

- Employers.
- Employees.
- Two or more persons jointly engaging in professional activity.
- Self-employed persons.
- Family businesses.
- A party renting manpower.
- The party in control of a worksite.
- A party carrying on activity at a common worksite.
- The client commissioning building or civil engineering work.
- The client’s delegee
- Building work environment co-ordinator for planning and design or for the execution of the work
- A person taking part in project preparation and design.

All the groups which have now been enumerated need to study the full content of these stipulations of the Provisions and to decide the extent to which the Provisions affect their activities. An employer, for example, needs to take account of all stipulations except those expressly addressed to someone else.

It may very often be the case that in practice the employer has no control over conditions in a place where work is to be undertaken. But if conditions are therefore short of the requirements of these Provisions, the employer must instead suspend work until things have been put right. It is always the employer’s duty to ensure that he is not carrying on work contrary to the Work

Environment Act or to Provisions issued by the National Board of Occupational Safety and Health or the Work Environment Authority.

**How are rules applicable when private individuals have building and civil engineering work done and the Consumer Service Act is applicable**

The stipulations on sanction charges pursuant to Sections 7, 8 and 12 are also applicable to private individuals who have building or civil engineering work done and where the Consumer Service Act (1985:716) is applicable. This means that even private individuals who, for example, have a house built or who have a house refurbished, extended, renovated or maintained may be forced to pay a sanction charge unless the house owner has agreed with someone else (often a contractor) that this person shall independently stand responsible for planning and project planning and design of the work or for the execution of the same (or both). If the party with which the house owner has concluded this agreement is independently responsible for the entire building project, the work environment responsibility of the client (the house owner) is automatically transferred to this party if the Consumer Service Act is applicable; see the Work Environment Act, Chap. 3, Section 7 c. The party with which the house owner has concluded this agreement is considered to be independently responsible if this is a turnkey or general contractor. That said, a contractor in a shared contract is not considered to have independent responsibility for the building project, so if the contract is shared the client himself is forced to pay a sanction charge. Thus this means that the house owner that does not wish to retain his work environment responsibility pursuant to the Work Environment Act needs to take care to order a turnkey contract or a general contract for the works that he wishes to have performed unless the house owner wishes to retain his work environment responsibility in the capacity of client.

**Guidance on individual Sections**

**Scope and definitions**

**Guidance on Section 1**

Putting it simply, these Provisions can be said to apply to all work needed for the erection, maintenance and demolition of a building or civil engineering structure. The list in this section comes mainly from the "Construction

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Sites Directive", Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites, and merely exemplifies what can be classed as building and civil engineering work, i.e. is not exhaustive. Diving work in connection with bridge building is one example of civil engineering work not mentioned in the list. Works needed in order for building works to run smoothly, such as the erection of huts and other establishment units, the erection of scaffolding and other temporary structures, the assembly of lifting devices and so on, also come under these Provisions if the works take place in connection with building or civil engineering work.

A construction site, by nature, is temporary/mobile. If, then, a new building is erected or, say, maintenance work is done to an existing building on a permanent worksite, the building activity will be a construction site on the permanent worksite. On the other hand, these Provisions do not apply to the factory production of prefabricated houses, bridges etc. (cf. Section 10 a).

As regards civil engineering work, mention can be made of the construction of roads, streets, squares, airfields, bridges, harbours, hydropower stations, wind farms, golf courses, play areas and parks. Other examples include the installation below ground of water and sewerage mains, the construction of networks for power, telecommunications and data transmission (e.g. overhead power lines, mobile telephony masts etc.), surfacing work and rail track maintenance etc.

Excavation is taken to include soil excavation and rock-blasting for house foundations, as well as for a tunnel or rock cavern intended for a power station, sewerage facility etc. Rock-blasting in quarries or in the course of mining operations, on the other hand, does not count as building and civil engineering work.

Earthworks include foundation reinforcement (e.g. piling), rough grading, spreading base course and surfacing on the ground, and installation of pipes below ground.

Construction or building work in the list refers to building in a more limited sense. Often it means wood, concrete and bricklaying works for a house or structure and the additional works required in such a connection. Sometimes other works may come to be included in this category.



Prefabricated elements are large prefabricated structural units, e.g. for housing or bridges, which are assembled on site. This can also mean larger units of formwork being hoisted into position, e.g. with a crane.

An interior fitting refers, for example, to the construction or assembly of fixtures, such as kitchen cupboards, fitted wardrobes and shop or reception counters.

Installation of equipment is taken to mean work on the kind of equipment pertaining to a building or civil engineering structure and needed in order for it to function and be capable of accommodating the people working there when the building is complete, e.g. installations for heating and air conditioning, lighting, electricity, water and sanitation for personnel facilities etc. Assembly, maintenance or disassembly of a factory's processing plant/working equipment and the making of installations for, say, electricity and water for that equipment do not, on the other hand, come under these Provisions except as regards more typical building works needing to be done, such as excavation, backfill, concrete works, e.g. for plinths, the laying of power cable tubes below ground, the provision of tube supports and tube bridges, supports for cable racks etc.

Alteration of a building or structure can mean alteration or addition or some other external or internal measure whereby, for example, the layout, façade or structure of a building is altered. Alteration is also taken to include the replacement of fixtures and materials to a greater extent than is entailed by maintenance.

Renovation of a building means restoring or modernising it to a state technically corresponding to a new building. A building can also be partly renovated.

Demolition or disassembly refers to both the demolition or disassembly of, say, parts of a building and demolition or disassembly of the building in its entirety.

Repairs and on-going and periodic maintenance count as building and civil engineering work. In both cases the building or structure is modified in some way or other. Repainting of a building, partly or wholly also counts as building and civil engineering work, as well as the cleaning which precedes painting.

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Drainage comprises measures to lead off water from ground or from a building or structure. This can mean drainage layers of gravel beneath and surrounding a building or road, pipes for leading off water from such a layer, drainage channels behind shot-crete in a tunnel, and so on.

Decontamination can, for example, take the form of asbestos decontamination prior to a structural alteration or decontamination of polluted soil where a building is to be erected.

The operation of a building or structure falls outside the scope of these Provisions. Sometimes the line between maintenance and operation can be a hard one to draw. Cleaning and window cleaning count as operation, as do chimney sweeping, cleaning of ventilation systems, cleaning or replacement of filters etc. Lawn mowing and other gardening work also count as operation, along with clearance of trees and branches, e.g. below power lines, alterations to transmitters in mobile telephony masts and so on. Operation is also taken to include the cleaning of roads and streets, whereas scraping of a gravel road or repairs to asphalt surfacing count as maintenance. It should be made clear, however, that works normally counted as operation also come under these Provisions when undertaken as part of or in connection with building and civil engineering work. Works of this kind include, for example, replacement of light bulbs in a building under construction or the cleaning of a building, window cleaning etc. in connection with the building's completion.

Design is usually taken to include that part of the construction process where it is decided, on the basis of drawings, calculations, and descriptions or such-like, how a building or civil engineering works is to be constructed and what it is to look like when finished. In many cases, parts of the design do not occur until the construction site has been set up, i.e. during the project execution stage. Note that the compilation of documents describing maintenance work also ranks as design.

#### **Guidance on Section 1a**

Winter road maintenance and snow clearance on roofs do not count as building or civil engineering work. The paragraph makes it clear that certain listed stipulations in the regulations are nevertheless applicable for such works. As regards winter road maintenance, these stipulations relate to planning, first aid, selection of work methods and equipment, information and instructions for employees, personal protective equipment and a stipulation on high-visibility clothing. In the case of snow clearance on

roofs, there are stipulations on roof work and precautions against falls which shall be applied. Failure to comply with the fall protection stipulations will attract sanction charges. Other stipulations in the regulations, e.g. the stipulations on a work environment plan, are not applicable to these works.

Note that regulations on protection against falls can also be found in National Board of Occupational Safety and Health regulations concerning protection against injury due to falls.

As specified above under the guidance on Section 1, the regulations are, however, applicable in their entirety if the said works are executed as part of or in conjunction with building and civil engineering work.

**Guidance on Section 1b**

Huts containing facilities for office work (site management etc.) and sometimes also for other work, e.g. repairs to machinery/tools, are usually provided, especially in connection with large-scale building and civil engineering work. The activities in question are sometimes accommodated on pre-existing premises or completed spaces. The Provisions do not apply to work premises of this kind, which instead come under the Provisions of the National Board of Occupational Safety and Health on Workplace Design. Certain provisions on evacuation and fire safety, however, are also included in the Provisions on Building and Civil Engineering Work (Sections 28 and 32).

The Provisions of the National Board of Occupational Safety and Health on Workplace Design also apply to personnel facilities at construction sites (including port cabins).

Note that some stipulations of the Provisions on Workplace Design concerning lighting, noise and warning signs apply conjointly with the Provisions on Building and Civil Engineering Work everywhere on the construction site and not only in huts or premises as mentioned above.

**Guidance on Section 2**

Under the Construction Sites Directive, a self-employed person on the construction site has to conform with much the same Directive stipulations as apply to health and safety conditions for employees. As has already been mentioned, Sweden has undertaken to transpose the Construction Sites Directive to Swedish Provisions. Under Chap. 3, Section 5, 2nd paragraph of the Work Environment Act, however, the persons carrying on commercial

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activities singly or together with members of their families and without having any employees only have to comply with provisions made in or by authority of the Work Environment Act “concerning technical devices and substances capable of causing ill-health or accidents, and also concerning worksites common to several enterprises (“common worksites”)”. This is not sufficient to meet the requirements of the Construction Sites Directive.

In Chap. 4, Section 10 of the Work Environment Act, therefore, the National Board of Occupational Safety and Health has been empowered, with reference to persons carrying on commercial activities singly or together with members of their families and without having employees, also to issue Provisions in respect other than those following from Chap. 3, Section 5, 2nd paragraph of the Work Environment Act. Accordingly, through Section 2 of these Provisions, the Board imposed on persons carrying on commercial activities, singly or together with members of their families, without having employees a wider “work environment responsibility” for their own health and safety in the undertaking of building or civil engineering work. This Section indicates in detail the stipulations concerned. This responsibility means that such persons are obliged to plan and arrange for their work in such a way that they can undertake it under work environment conditions as safe and healthy as those required for employees.

#### **Guidance on Section 3**

Chap. 3, Section 6 (1) of the Work Environment Act requires the party commissioning building or civil engineering work (the client) to appoint a building work environment co-ordinator for planning and design, with the duties set forth in Section 7 a, and to appoint a building work environment co-ordinator for the execution of work, with the duties set forth in Chap. 3, Section 7 b of the same Act. One and the same undertaking or person can be appointed for both tasks. Either task or both of them can be assumed by the client. Further to this point, see the guidance on Section 6.

Stipulations on protection against vehicular traffic passing by or through a place or area where building or civil engineering work is carried out are contained in Sections 81-86. They refer to “external” (public) traffic, including track-bound traffic. (Note especially Section 82.)

Provisions on protection from vehicular traffic on the site in connection with the building or civil engineering work are, on the other hand, contained in Sections 38, 40 and 41.

A client's delegee can, for example, be a turnkey contractor entrusted independently with the planning, design, preparation and execution of a building project and assuming, by agreement, the client's responsibility for the work environment of the entire project, or a general contractor who has been tasked with the execution of a building project and by agreement has assumed the client's responsibility for that part. If, on the other hand, the Consumer Services Act is applicable, then in principle no special agreement is necessary and the client's responsibility automatically passes to a contractor as mentioned above. The Work Environment Authority can "return" the responsibility to the client. Further to these points, see Chap. 3, Section 7 c and Chap. 7, Section 6 (3) of the Work Environment Act. Attention is also drawn to the remarks made in the guidance on Section 4, below.

#### **Basic provisions of the Work Environment Act**

##### **Guidance on Section 4**

Certain of the stipulations previously contained in these Provisions have now been transferred to the Work Environment Act itself; at the same time as further additions have been made to the Act with a view to more clearly transposing the Construction Sites Directive to Swedish law (see "Background", above). The amendments to AFS 1999:3 which have now been made through AFS 2008:16 supplement the transposition of the Construction Sites Directive to Swedish law. The new provisions of the Work Environment Act cannot be commented on in these General Recommendations, but a thorough knowledge of them is essential in order to obtain a complete picture of the rules applying; see Chap. 3, Section 6 of the Work Environment Act and the sections following.

If the Consumer Services Act is applicable, then, putting it simply, under the Work Environment Act the client's responsibility for the work environment devolves from the very outset on the contractor (though not, for example, in the case of a split contract), unless the client and the contractor have agreed in writing that responsibility is instead to rest with the client. Further to this point, see Section 7 c (2) of the Work Environment Act. Information concerning the Consumer Services Act is obtainable from the Swedish Consumer Agency.

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### ***Responsibilities of the party commissioning building or civil engineering work***

#### **Guidance on Sections 5-5 a**

##### *Introductory remarks*

The purpose of these stipulations is for the persons drawing up and co-ordinating the construction documents already at the project preparation stage to make the risk assessments and indicate the solutions which are needed in order for safety to be acceptable at the project execution stage. It is natural for these risk assessments and proposed solutions to form the basis of the work environment plan enjoined in Sections 8, 12 and 12 a. This will make it easier for the individual contractor to plan and undertake in an acceptable manner from the health and safety point of view the works for which he has been contracted.

The stipulations in these sections also apply to the planning and project preparation preceding the actual design phase.

Sometimes building or civil engineering work is procured without, for example, a detailed specification of all the materials to be used, the choice instead being left, within certain limits, to the contractor engaged for the work. If so, the contractor will be a participant in the design process; see Section 10. Overarching responsibility for work environment considerations being taken into account still rests, however, with the client/client's delegee.

It is very important from a safety and health viewpoint that preparation of the work environment plan should not be put off until the construction site is about to be set up.

##### *Special remarks*

Examples will now be given of ways in which safety and health factors can be taken into account in various respects.

##### *Guidance on Section 5, point 1*

The position of the building or civil engineering work can have a crucial bearing on the possibilities of arranging transport operations to and from the site in a satisfactory manner and also of using the lifting and transport devices which are needed.

##### *Guidance on Section 5, point 2*

Manual handling is a common cause of accidents and ill-health in connection with building and civil engineering work. Ill-health also occurs as a result of

allergy and hypersensitivity. At the project preparation stage, safety and health considerations can be taken into account through the choice of building products. It is particularly important to ensure

- that the handling or assembly of the building products does not cause ill-health or accidents,
- that the shape and size of the building products are appropriate to the spaces where they are to be fitted,
- that the chemical products chosen are not more dangerous than needed for the achievement of an acceptable result, and
- that the building products do not give rise to spillage, waste products, packaging and suchlike capable of causing ill-health or accidents.

Stipulations on ergonomics concerning musculoskeletal conditions at work are contained in the Provisions of the National Board of Occupational Safety and Health on Ergonomics for the Prevention of Musculoskeletal Disorders.

*Guidance on Section 5, point 3*

Work on structures below the ground water table generally requires special care in design and planning. Information which may furnish guidance for work of this kind is contained in H374 Schakta säkert, published by the Work Environment Authority.

Work with prefabricated frames can entail manifold hazards. Many accidents can be avoided if lifting eye bolts or other aids to the handling of prefabricated elements are designed and proportioned according to the stresses to which they may be subjected in the course of handling, transport, storage and assembly. The positioning of the lifting eye bolts so that the balance position of the element coincides with the position which it will occupy when assembled is often a prerequisite of safety in the assembly, fitting and securing of the element and its detachment from the lifting device. All is applied equally to arrangements for guidance and lane indication installed on or beside streets and roads.

Work on assembling and dismantling temporary supports often entails a risk of musculoskeletal injuries and of falls, collapses and overturning. These risks can be averted if structures for buildings, bridges and other civil engineering works are designed so that stability can be achieved during the construction phase without temporary supports. The risk of falls will be reduced if structures which can be trodden on during the construction phase have sufficient load-bearing capacity.

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Section 12a requires the work environment plan (see Section 12) to contain a description of measures, e.g. in connection with work involving the launching, assembly and disassembly of heavy structural elements or heavy shuttering elements (point 11). This can mean describing the stabilisation measures needing to be taken at different stages of assembling a structure, in order for the stability of the structure to be assured during all phases of its erection. The description may need to include a special drawing. It is essential that this drawing be prepared in connection with the project preparation and appropriate that it should be prepared by the structural engineer, who can be presumed familiar with the workings of the structure. It is appropriate for the description then to be added to the work environment plan, following any necessary adjustments.

#### *Guidance on Section 5, point 5*

During the planning and design stage it may be necessary to investigate

- how installations and other technical devices can be conveyed to their position and installed there, and
- whether suitable means of transport and lifting aids can be used.

When planning and designing works entailing the replacement of installations, it is important to bear in mind that manual breaking among other things entails a serious risk of vibration injuries and of musculoskeletal injuries, as well as generating harmful dust. Solutions should therefore be chosen which minimise the need for manual breaking.

#### *Guidance on Section 5 a, point 1*

Construction times which are too short for the work environment to be properly organised are a common problem in the construction industry. Shortness of time causes stress, which in turn leads to a heightened risk of accidents. A short construction time can also mean several different works, e.g. electrical and plumbing installation work, having to be done simultaneously within a limited space, which again augments the risk of accidents. Often it also means shortage of space, which aggravates the risk of musculoskeletal injuries, partly because of the limited scope for using good assistive devices. The factors which have now been mentioned are examples of circumstances which, under this point of the section, may need to be taking into account at the planning stage.



*Guidance on Section 5 a, point 2*

Manual carrying of building materials involves unnecessary risks of musculoskeletal injuries to the workers concerned. To reduce those risks, it is important, as part of the planning and design process, to create conditions that make wheeled handling and transport of materials possible in places where use of a crane or suchlike is not possible.

Bathroom renovations in apartment blocks are a troublesome kind of work from a health and safety (work environment) viewpoint and may require special reflection at the planning stage in order to achieve an acceptable work environment. The work of breaking and removing existing material generates noise and dust and the work of removing demolition spoil and bringing in new material often gives rise to a great deal of heavy manual labour which can be ergonomically unsuitable. It is important that the client should, when planning the work, make it possible for transport operations to be organised in such a way that manual carrying on stairs can be kept to a minimum. A construction hoist and the possibility of bringing materials in via balconies or intake platforms and load openings in façades can solve this problem. Sometimes demolition spoil can be removed by suction, using suitable equipment. New concrete can be pumped in.

Manual braking entail a risk of vibration injuries. This method is unsuitable if concrete or suchlike needs to be removed in large quantities, and accordingly it is important to provide conditions permitting, for example, the use of machine-mounted breaking equipment. It is also important that suitable means of dust prevention should be made possible.

*Guidance on Section 5 a, point 3*

An establishment area is an area within which the contractor is permitted to place portacabins, stores, depots etc. needed for the building operation. An area of this kind is often located partly or wholly outside the actual construction site. When building in urban areas, space is often at a premium and the placement of portacabins etc. difficult to organise. It is important, however, that space should still be available for personnel facilities for all personnel who will be working on the construction site, including those employed there in a more temporary capacity.

**Guidance on Section 5 b**

It is common for works also to be planned and designed after construction work has started. The requirement in this section concerning planning and preparation well in advance obviously applies to cases of this kind as well.

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Deleterious material may be present above all on old properties. In order for work environment viewpoints during the construction phase to be taken into account prior to renovation, rebuilding or demolition, it has to be ascertained, by one means or another, and before work commences, whether or not there is health-endangering material present in the relevant parts of the object.

The planning of demolition work often calls for the compilation of a description (see Section 12 a (2), paragraph C, point 13), giving an account of the various phases of demolition and the measures required, the overall aim being to ensure the stability of the structure while the different phases of demolition are in progress. Accidents have occurred as a result of such stabilising measures being overlooked. Demolishing a structure can be more hazardous than erecting it.

#### **Guidance on Section 6**

The requirement for a building work environment co-ordinator to be appointed is set forth in Chap. 3, Section 6 (1), points 2 and 3 of the Work Environment Act; cf. Section 3 of these Provisions. Both a legal and a natural person can be appointed building work environment co-ordinator. The requirement, under the above mentioned statutory section, for the building work environment co-ordinator to be suitable has been elucidated in Section 6 of these Provisions. The suitability requirement also applies to a "self-appointed" co-ordinator.

In order for the system of responsibility under the Work Environment Act to be workable, it must always be perfectly clear who has been appointed building work environment co-ordinator. A legal person appointed, may e.g. be a limited company. A natural person appointed may be an employee of a legal person, or again a self-employed person (sole proprietorship), with or without employees, or one of the self-employed person's employees. Who actually deals with matters of co-ordination is another question. It may be the building work environment co-ordinator in person, one of his employees or outsourced personnel. But it is the legal or natural person appointed building work environment co-ordinator to whom the Work Environment Authority is empowered to address any requirements regarding co-ordination, and it is that person who, where execution of the project is concerned, must be given as building work environment co-ordinator in the documents (prior notice and public notice) referred to in Section 7. The Work Environment Act lays down that at any given point in time there may be only one building

work environment co-ordinator for planning and design and one for the conduct of the work. On the other hand the same legal or natural person may be appointed to discharge both co-ordination duties. Furthermore, a building work environment co-ordinator can, at a given point in time, be “relieved” by another. However, it must at all times be clear who has been appointed building work environment co-ordinator for, respectively, planning and design and execution of the work.

Knowledge which can be needed by personnel who are to work with building work environment co-ordination includes, for example, basic knowledge concerning the work environment (health and safety) and a good knowledge of the Work Environment Act, the Work Environment Ordinance and at least the following provisions issued by the Work Environment Authority:

- Provisions on Building and Civil Engineering Work.
- Provisions on Systematic Work Environment Management.
- Provisions on Ergonomics for the Prevention of Musculoskeletal Disorders.
- Provisions on Workplace Design.
- Provisions on Ladders and Trestles.
- Provisions on Scaffolding.
- Provisions on Asbestos.
- Provisions on Chemical Hazards of the Working Environment.

In addition to these Provisions, further knowledge may be needed, depending on the risks which the work entails. Personnel who will be working with work environment co-ordination during the execution phase generally need to have a close knowledge of the following Provisions in addition to those already mentioned:

- Provisions on the Inspection of Lifting Appliances and Certain Other Technical Equipment
- Provisions on the Use of Lifting Appliances and Hoisting Gear
- Provisions on the Use of Work Equipment
- Provisions on Cartridge-Operated Fixing Guns
- Provisions on Nail Guns
- Provisions on Noise
- Provisions on Vibrations
- Provisions on Quartz

The qualifications of the building work environment co-ordinator or of the co-ordinator’s personnel can, where training is concerned, be substantiated

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by a training matriculation certificate and, as regards competence and experience, by certificates from a previous or present employer.

Basically, the person attending to building work environment co-ordination issues needs the following experience in order to be capable of discharging his duties:

- Experience of the conduct of building and civil engineering work.
- Experience of co-ordinating, directing or managing construction projects (important for the sake of overview).
- Experience of project preparation (this applies to the person who will be in charge of building work environment co-ordination during planning and design; that person may also need to have gained the experience referred to in the two preceding points.)

How extended the experience is needed to be hinges on the size and character of the construction project to be co-ordinated.

In order for co-ordination during the construction project to run smoothly, everyone working on the project needs to know who the building work environment co-ordinator is and how a representative of the co-ordinator can be contacted. This applies both during the preparation and planning of the project and during its execution.

#### **Guidance on Section 7**

When calculating the number of the persons who are employed simultaneously on any one occasion or the number of person-days, all persons on the building site who assist with the building or civil engineering work being carried out will be counted.

Only the details which are known need to be specified in the prior notification.

#### **Guidance on Section 8**

The purpose of the work environment plan, inter alia, is to provide a foundation concerning how work environment management shall be implemented and, if work involves particular risks, to offer solutions concerning how anticipated hazards shall be avoidable. The work environment plan thus will act as an aid for the individual contractor when he shall plan his activities on the building site.

Work on compiling the work environment plan should preferably commence at the same time as project planning and design and early planning. A major advantage of this is that this may then act as documentation of the considerations developed in respect of the work environment during project planning and design and during planning.

Two days in succession means two subsequent days during which work is carried out, irrespective of how many hours are worked on either of the days.

**Guidance on Section 9**

Part of the purpose of the documentation referred to in this section is that it should be available for consultation in connection with the operation, maintenance, alteration etc. of the object and also in connection with its demolition.

*Duties of certain other parties with safety responsibilities in the course of planning, design and project preparation*

**Guidance on Section 10**

Cf. Chap. 3, Section 7 of the Work Environment Act. Normally the client engages different specialists for the design: architects, structural engineers, consultants for electrical power supply, heating and plumbing, telephone and data networks and so on.

The possibility in certain case of a contractor coming to participate in design is touched on in the third paragraph of the introductory guidance on Sections 5-5 a, above.

It is appropriate that the structural engineer designing the framework of a building should be engaged to prepare a description, as mentioned in the General Recommendations accompanying Section 5, above, of measures to stabilise a framework under construction. Similarly, it may be appropriate to engage a structural engineer to prepare a description of the stabilisation of an object scheduled for demolition during the different phases of the demolition process: see the General Recommendations accompanying Section 5 b.

**Guidance on Section 10 a**

In connection, for example, with hall buildings, but also buildings of other kinds, it is important to consider the stabilisation of the framework during the construction period. Sometimes the persons erecting buildings have insufficient knowledge of the stabilisation measures needed, and it is therefore appropriate for instructions concerning the stabilisation of the building to

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accompany its delivery. It is appropriate for these instructions to be drawn up in such a way that they can serve as supporting documentation for corresponding parts of the work environment plan for the construction project.

It is also important for lifting eye bolts or other devices for lifting elements and parts of buildings to be dimensioned to withstand all the loads to which they can be subjected throughout the handling process, i.e. from hoisting in the factory and in transit until they are installed in the building.

#### *Duties of building work environment co-ordinators appointed for planning and preparation*

##### **Guidance on Section 11**

It may be natural for the party commissioning the building or civil engineering work to commission the building work environment co-ordinator to monitor all work environment issues arising in the course of preparatory planning and design.

It is important for the co-ordination aspects of safety and health conditions to be already taken into account at the beginning of the project preparation stage. It is also important that co-ordination aspects be clearly stated in the instructions to those taking part in the design of the project. These persons should also be informed of others taking part, of the way in which co-ordination is to be organised and of the co-ordinator's identity.

Good co-ordination in connection with planning and design requires the building work environment co-ordinator to ensure that no incongruences capable of affecting the work environment occur between the different designers' building documents. Co-ordination can, for example, be needed between those designing frameworks and those designing installations, so as to ensure, among other things, that sufficient space is provided for incoming transport and assembly. This co-ordination may also concern the need for holes and recesses, arrangements for securing safety devices and for securing necessary aids in connection with incoming transport, assembly etc. Indication of these matters in the building documents will make it possible for the measures to be already taken or prepared when the framework is manufactured or constructed on site. It will then be possible, for example, to dispense with breaking and drilling of concrete, with all the hazards this implies.

Co-ordination of project preparation and design can avert situations where, for example, the spaces for ventilation ducts or cables etc. for various installations are made so low or cramped that during the project execution stage

the contractors have to resort to improvise solutions of a kind unsatisfactory from the viewpoint of safety and health. Cf. Section 62.

In spaces where several installations are to be made, it is important to consider the order in which installation work can proceed.

Matters of co-ordination also include considering the time it takes for structures, coatings and surfacing to harden and dry.

When existing buildings and installations are to be altered, maintained or adapted for new users, many of the preconditions with a bearing on safety and health cannot be influenced through project preparation and design. Special importance then attaches to co-ordination. The fact of such work often having to be completed in a short time also increases the need for co-ordination.

**Guidance on Section 12**

See the guidance on Section 8.

Two days in succession means two subsequent days during which work is carried out, irrespective of how many hours are worked on either of the days.

**Guidance on Section 12 a**

The size and content of the work environment plan will generally depend on the extent of the works and on the hazards which can be anticipated when the work is undertaken.

*Guidance on Section 12 a (2) A*

Rules may, for example, be needed concerning:

- contingency measures for dealing with accidents and sudden illness, and points to be observed, respectively, by all persons and by those assigned particular duties,
- contingency measures for dealing with fire, maintenance, inspection of and information concerning fire-fighting equipment and points to be observed, respectively, by all persons and by those assigned particular duties,
- electrical safety,
- use of transport routes on the construction site,
- possible supervision of persons passing in to and out from the site,
- general minimum requirements for personal protective equipment,

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- points to be observed concerning general safety devices, scaffolding, mobile work platforms etc.,
- points to be observed when hitching loads,
- signalling to crane operators,
- other points to be observed on the construction site as regards lifting devices and other technical devices which are subject to inspection,
- how the construction site is to be kept clear of spillage, litter etc., e.g. who is to clean up and when, where the waste is to be deposited, etc.,
- use of reception and storage spaces for materials and equipment,
- times when work or certain types of work may not be carried out,
- zones or spaces which may not be used or entered,
- conditions for the use of working methods causing high temperatures and/or showers of sparks,
- occasions when the use of machinery generating noise above a certain level is permissible, and
- times when work causing air contaminants may be undertaken.

#### *Guidance on Section 12 a (2) B*

A section dealing with work environment organisation on the construction site may need to include particulars of the following:

- the identity of the party commissioning the building or civil engineering work,
- where relevant, the identity of a client's delegee who has taken over the client's responsibility for the work environment,
- the building work environment co-ordinator,
- the person in charge of fire safety,
- the person in charge of electrical safety,
- the identity of the person issuing permits for hot work,
- permits needing to be obtained from national or local authorities, road authorities or owners of installations for electricity, telecommunications, gas etc.,
- the safety delegates stationed at the construction site,
- times of safety inspection tours and the persons who shall be taking part in them,
- persons with first-aid training,
- emergency preparedness for dealing with accidents, and
- closure devices and arrangements needed to prevent passing vehicular traffic from entering the zone where building or civil engineering work is in progress.



*Guidance on Section 12 a (2) C*

For the planning of the work and of the safety organisation during the construction phase, it is appropriate that the work environment plan should already be presented at the tendering stage, insofar as conditions are known. When the contractors are appointed, it is appropriate to consult them on the further design of the work environment plan. It may be a good idea to establish early on which enterprise is to be co-ordinator on the construction site during the project execution stage.

Sections 8 and 12 require the work environment plan to be available before the site is set up. It is usual that some works, including those mentioned in Section 12 a (2) C, are not designed until after the site has been set up. For such works, the work environment plan is to show such particulars as are known and have a bearing on the safety and health of the persons undertaking the work. Further particulars about these works can then be added to the plan as the design progresses. The same procedure can well be applied concerning works which are not preceded by design.

If alterations are made to previous project design, it is important that corresponding changes are introduced in the work environment plan.

Descriptions referred to in Section 12 a (2) C may, for example, concern:

- Fall arrest systems which can be used and how they are to be assembled.
- How protection against falls is otherwise to be arranged.
- Which support or stabilisation measures need to be taken in connection with excavation work; see also the General Recommendations accompanying Section 5 and the book H 374 Schakta säkert, published by the Work Environment Authority.
- 1) How work with chemical and biological substances entailing special hazards (e.g. thermosetting plastics, PCB, asbestos, quartz) is to be conducted in a manner compatible with the safety of those actually doing the work and other persons present on the construction site, and 2) what safety, screening-off or ventilation measures need to be taken in this connection.
- Safety clearances and other safety precautions occasioned by the work being undertaken in the vicinity of high voltage power transmission lines.
- Safety precautions needed for the avoidance of drowning accidents in connection with work on bridges, quaysides and barges.
- Devices for the assembly of prefabricated elements.

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- Stabilisation measures needed for the framework during erection; see also the General Recommendations accompanying Sections 5 and 10.
- Which scaffoldings, work platforms, guardrails and anchorages for personal protective equipment are needed, and how these devices are to be assembled and anchored.
- Instructions on the safe demolition of a building or load-bearing structures; see also the General Recommendations accompanying Sections 5 and 10.
- The traffic and closure arrangements needed in order to prevent vehicular traffic from entering the place or area where building or civil engineering work is in progress.
- The measures of support or stabilisation needing to be taken in connection with demolition work; see also the General Recommendations accompanying Section 5 b.

Section 12 a C, point 4: the National Institute for Radiation Protection has been abolished, and its former duties are now discharged by the Swedish Radiation Safety Authority.

The general remarks made in the guidance on Section 8 concerning the urgent importance of starting to draw up the work environment plan from an early stage also apply to these descriptions.

Further General Recommendations on the preparation of work environment plans will be found in the guidance on Sections 78-80 (demolition) and 81 (passing vehicular traffic).

#### **Guidance on Section 12 b**

The documentation may comprise selected parts of the as-built documents normally prepared in connection with construction works, supplemented by suitable work environment information.

#### ***Responsibilities of building work environment co-ordinators during the execution of a building or civil engineering work***

##### **Guidance on Sections 13-15**

The planning which belongs to the execution phase, and which therefore forms part of the work with which the building work environment co-ordinator during the execution must always concern himself, includes production planning, both initial planning and rolling planning where the plans are adapted to the actual progress of production, planning when disruptions occur, and planning at a more detailed level in the form of work preparations

determining how individual tasks, e.g. formwork for a specific section, are to be performed. Production planning also includes materials administration, selection of working methods for individual tasks, etc. Safety work on the work site generally needs to be co-planned with the said planning in order to achieve a good work environment.

The work environment viewpoints referred to in Section 13 relate to risks which do or may result from several people working in a work area. Work equipment means the same as in the Swedish Work Environment Authority's regulations on the Use of work equipment.

Certain guidelines for work environment activities are normally found in the work environment plan. As soon as the building site has been set up, it is appropriate for the building work environment co-ordinator at a meeting with others active on the building site to provide information on the work environment plan and make the adjustments to it which may be needed. It is appropriate for safety delegates, safety engineers and representatives from the occupational health service to participate in this meeting.

Pursuant to Chap. 3, Section 7 b compared with Section 7 e of the Work Environment Act, it is the building work environment co-ordinator that shall ensure that personnel facilities and sanitary arrangements are established to the requisite extent on a shared work site. The Swedish Work Environment Authority has announced regulations concerning Workplace design. These also include stipulations relating to personnel facilities and sanitary arrangements.

The rules for the building site which are specified in the work environment plan may, where appropriate, be used as a basis for the rules of order and safety issued by the building work environment co-ordinator. At the same time, it is important for the work environment plan to be adjusted so that the rules specified therein match those issued by the building work environment co-ordinator.

One important task for the building work environment co-ordinator is to ensure that the building site is kept tidy and in good order.

The employer will always be responsible for his own employees, irrespective of the coordination responsibility.

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The stipulation stating that building work environment co-ordinator, pursuant to Chap. 3, Section 7 b of the Work Environment Act, shall see to it that the work environment plan is kept available on the construction site so that everyone working there can view it means, inter alia, that the work environment plan should be available in Swedish or English and that the content may need to be translated into other languages in a manner which is adapted to suit the needs of the construction site. The plan may be made available in hard-copy or digital format. In the latter case, everyone should have access to this.

It is important that the adjustments in the documentation which is to be compiled pursuant to Sections 9 and 12 b are carried out so that the documentation matches the finished building or structure as it stands.

Necessary permits as mentioned in Section 15 may be such written permits as employees shall have received from the employer pursuant to the Swedish Work Environment Authority's regulations on lifting devices and lifting accessories or the regulations on trucks, permits that allow the employees to use such devices.

Two days in succession means two subsequent days during which work is carried out, irrespective of how many hours are worked on either of the days.

#### **Guidance on Section 16**

The building work environment co-ordinator may appoint one or more persons to attend to matters of co-ordination; cf. Section 6 and guidance on the same. It is important that the person or persons attending to matters of co-ordination should be apprised of the building documents and work environment plan at the earliest possible juncture.

#### ***Co-ordination responsibilities of other undertakings at the construction site*** **Guidance on Section 17**

The stipulations of the Work Environment Act on co-ordination imply a duty of complying with the instructions given by the co-ordinator. The co-ordinator needs to be kept continuously informed of matters relevant to safety, so as to be able to decide on appropriate measures and who is to take them. This does not only apply to hazards indicated in Section 12 a C. Particulars of hazards with which the co-ordinator is to be provided under Section 17 may, for example, concern:

- machinery or chemical products used,

- changes made to scaffolding,
- reworking carried out or planned, or
- re-scheduling of certain work etc.,

The Work Environment Act also lays down other basic duties, such as that of not endangering others at a common worksite through one's own activity (see Chap. 3, Section 7 g of the Work Environment Act).

Effective co-ordination also depends on the co-ordinator being able to study inspection documents, inspection notices and suchlike records (also those addressed to different employers on the site) material to co-ordination.

It is important that the co-ordinator ensures that he is kept continuously informed by other contractors as to when they intend to have people working on the construction site.

It may be a practical arrangement for the co-ordinator to collect risk assessments from the undertakings active on the construction site.

#### **Guidance on Section 18**

Untidiness often entails a risk of falls due to someone slipping, tripping or missing their footing. Falls to a lower level, which are among the commonest causes of serious work injuries, are often preceded by events of this kind.

Measures for achieving a good standard of tidiness include, for example:

- adequate cleaning,
- the organisation of chutes, containers and skips for refuse in such a way that surplus material and spillage can be suitably disposed of, and
- adequate provision of storage areas and refuse bins.

Note that certain packaging is subject to handling restrictions, e.g. wrapping used for products which are flammable or dangerous to health; see the Board's Provisions on Dangerous Substances (AFS 1994:2).

Pre-separation of building waste is becoming increasingly common practice. This augments the need for storage areas and containers for material to be reused, recycled or tipped.

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### **Planning and setting up of a site or area for building or civil engineering work**

#### *General*

The employer's duty of planning, undertaking and following up his activity is more closely regulated in the Board's Provisions (AFS 1996:6) on Internal Control of the Working Environment. The employer shall, for example, continuously investigate his activity, so that hazards and deficiencies from a safety and health viewpoint can be mapped, assessed and eliminated as early as possible.

#### **Guidance on Section 19**

Chap. 2, Section 2 of the Work Environment Act requires all work to be "planned and arranged in such a way that it can be carried out in healthy and safe surroundings". It is important that planning of work starts as early as possible. The work environment plan made up according to Sections 10 and 11 can often form a useful basis for the planning of the works which are to follow.

It may be necessary to contact the relevant public authorities in order to obtain the permits which may be needed for traffic arrangements, speed reductions etc., in order for work to be undertaken safely. The authorities to be contacted may be road authorities, rail track owners, municipalities, rescue services, owners of electrical or other installations, and so on.

Factors also contemplated in subsection 1 of this Section include, for example:

- the place or area where the work is to be undertaken, its location and the conditions prevailing there,
- the possibilities of providing a sufficient supply of energy and water, the possibilities of organising transports of materials, other activity occurring round about the site or area where the work is to be undertaken and which may affect the conduct of the work, and
- passing vehicular traffic (see Section 3 and Sections 81-86).

It may be appropriate to draw up a layout plan for the worksite. This plan should show how communication routes, lifting devices, material reception facilities, field workshops, personnel facilities, offices etc., can be located. It is also important for this plan to show, for example, the location of electricity, water, compressed air mains etc., as well as communication routes. Before

the construction site is set up, it is advisable to ask the rescue services to examine the plan with regard to the establishment of personnel facilities and site management offices, as well as machinery and other technical devices.

When planning the work, consideration should be given to the possibilities of prefabrication or assembly in field workshops. In this way unsuitable work stations and working conditions can often be avoided.

**Guidance on Section 20**

It is important that machinery, cabins, storage areas and other things needed for the work are located in such a way that use of the specially arranged communication routes comes naturally.

**Guidance on Section 21**

This Section deals with the duty of the individual contractor to co-ordinate and timetable his own works. These stipulations also apply to the co-ordinator within the scope of his duties under Chap. 3, Section 7 b of the Work Environment Act.

Timetabling is especially important with regard to the final phase of construction work, when the premises are to be completed. Often during this phase, many different craftsmen and fitters need access to the same space in order to carry out their duties.

**Guidance on Section 22**

Provisions and General Recommendations on work near live parts of installations are contained in the High Voltage Provisions of the Swedish National Electrical Safety Board (ELSÄK-FS 1994:7).

Civil engineering work at a ferry terminal, in harbours or at bridges can mean having to walk and stand on the ice. If so it is important to make sure that the ice has sufficient carrying capacity and to equip the people doing the work so that they can get up on the ice themselves or be rescued if they fall into the water.

**Guidance on Section 23**

The requirement of demarcation and signage is intended to prevent the general public from entering a place or area where building or civil engineering work is carried out and where they may endanger the employees. Provisions for the protection of the general public are contained in the Public Order Act (SFS 1993:1617).

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An information board at the entrance to large construction sites can furnish suppliers and casual visitors with guidance, so that they will not unnecessarily expose workers there or themselves to danger.

*Installations, cables or other distribution systems for electricity, gas and water*

#### **Guidance on Section 24**

Electricity, telecommunication cables, gas, water and sewerage or other distribution systems are normally laid below ground. In buildings or installations which are to be altered, there may be installations for electricity, gas, water and sewerage and also, for example, for compressed air or hydraulics. Damage to such distribution systems can cause accidents and illhealth.

Before work begins, an investigation should be made of the shut-off devices existing.

#### **Guidance on Section 25**

The High Voltage Provisions of the Swedish National Electrical Safety Board (ELSÄK-FS 1994:7) apply, for example, to temporary electrical power installations, such as those occurring on building and civil engineering work.

The Provisions of the Swedish National Electrical Safety Board on Authorisation of Electricians (ELSÄK-FS 1996:2) permit only an authorized person to carry out work, for which tools are required, on electrical material belonging to a temporary electrical power installation.

It is important to plan the temporary electrical power installation as early as possible, because this improves the possibilities of supplying the various work stations with electrical power without long connection cables or leads being necessary. Unplanned cabling can easily cause power failures. It also entails a risk of tripping or missing one's footing, which in turn can result in falls. The need for emergency lighting may have to be taken into account; see Sections 28 and 43. If electric motors rotate in the wrong direction, this can entail a risk of work injury, and so it is important to check the phase sequence before a temporary electrical power installation begins being used.

It is appropriate that whoever assembles the electrical power installation should also be continuously take care of surveillance and examination of the electrical materials at predetermined intervals.



*Reception and storage spaces*

**Guidance on Section 26**

Unnecessary transfers of building products and other materials can be avoided if there is adequate space for reception and storage.

Suitable, preferably hard surfaces for reception and storage of materials will help to prevent collapses.

*Evacuation*

**Guidance on Section 27**

A safe area is above all outdoors, but it can also take the form of a rescue chamber or some other separate, fire-proof space.

Where building and civil engineering work is extensive or of a complicated nature, it is appropriate to contact the rescue service for consultations on matters of evacuation.

**Guidance on Section 28**

An emergency route is taken to include a door on that route and door leading out from it to a safe area. The door to an emergency route is also considered part of it.

Signs for evacuation as referred to in subsection 2 of this Section normally need to be put up near doors leading to an emergency route. Signs may also be needed along an emergency route where there is a risk of mistakes being made, e.g. if there is a change of direction or a bifurcation, so that people can go straight to a safe area without hesitating.

Stipulations on signage design are contained in the Provisions of the National Board of Occupational Safety and Health (AFS 1997:11) on Safety Signs and Warning Signals at Workplaces.

*First aid*

**Guidance on Section 31**

The National Board of Occupational Safety and Health has issued an Ordinance (AFS 1984:14) containing Provisions on First Aid in connection with accidents and sudden illness. The stipulations of Sections 1 and 2 of that Ordinance also apply on construction sites. The stipulations in Section 31 of AFS 1999:3 (i.e. of these Provisions) supplement the Provisions of AFS 1984:14.

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First aid rooms should be located so as to facilitate stretcher transport. Cf. Section 31 (h) of "Personnel Facilities" (AFS 1997:6).

A notice giving the addresses and phone numbers of the ambulance and rescue services should also display the address of the construction site and directions for getting there.

*Fire prevention. Fire detectors and alarm systems*

#### **Guidance on Section 32**

The risk of fire can be averted by choosing working methods which do not generate high temperature or produce sparks. It is important not to use products whose physical or chemical properties are capable of causing fire. It is also important that the quantity of flammable material in every space should be kept to a minimum.

Fire detectors and alarm systems may, for example, be needed:

- where a large number of employees are present simultaneously,
- where flammable substances are used,
- in a space where there are large quantities of flammable material,
- where emergency routes are long and
- where the rescue service has a long response time.

When fire detectors or alarm systems are temporarily turned off for maintenance or suchlike, it is important that they should be turned back on again as soon as the reason for their disconnection has been removed.

*Doors, gates, windows and walls*

#### **Guidance on Sections 34-36**

The stipulations of these Sections refer to conditions during the project execution stage. Stipulations on the design and safety of doors, gates and windows in the finished building or installation are contained in building legislation. See also Section 1b of these Provisions, with guidance on the same.

*Communication routes*

#### **Guidance on Section 38**

A loading bay should have dimensions suitable for the building products, goods, returned goods and packaging to be handled. The door of a load opening in a wall should open inwards or take the form of a sliding door. In other load openings, the safety device of the intake should consist of a gate or barrier which can be easily and safely opened and closed in connection with transport operations. The gate or barrier should be at least 1.0 metre high.

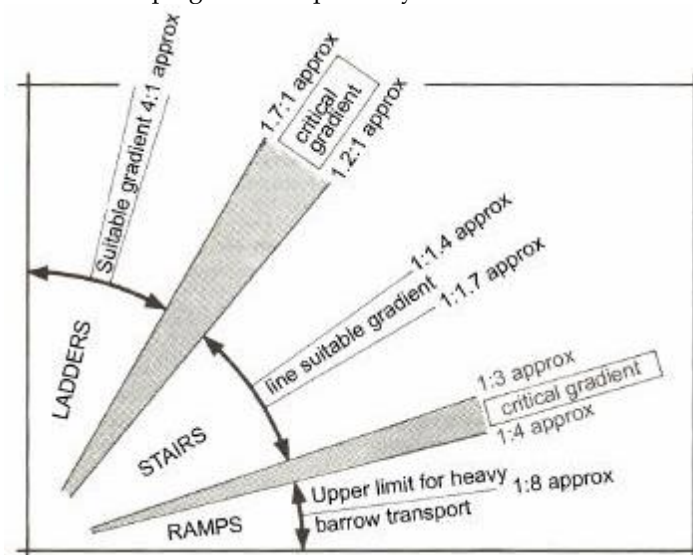
**Guidance on Sections 39-41**

As a starting point for assessing the suitable width of communication and access routes, the following measurements can for the most part be used:

- 3.0 metres - communication route intended for use with motor vehicles.
- 1.0 metre - ramp for transport of materials.
- 0.9 metre - footpath on ground.
- 0.8 metre - stairs.
- 0.6 metre - ramp for pedestrian traffic.

It is appropriate for landings on stairs to be positioned adjoining floor joists, scaffolding platforms or suchlike.

The following chart exemplifies suitable angles of inclination for ladders, stairs and sloping floors respectively.



Stipulations on the inspection and maintenance of access and communication routes are contained in Section 49.

Much stair-climbing is strenuous and fatiguing. If there is a great difference in level between the surfaces and many movements have to be made between them, this augments the risk of ill-health, hence the requirement of a lift in this Section. The amount of walking to be done on stairs will depend among other things on:

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- by how much the difference in level exceeds 10 metres,
- how long the work is expected to continue and
- the location of the personnel facilities (e.g. lunch room, toilets) which may be needed during the working day.

Even if the difference in level between the surfaces is less than 10 metres, it may still be appropriate for a lift to be provided if the employees have to do a great deal of walking on stairs between the floors.

The speed of vehicles has a bearing on the safety of the construction site. Special local speed regulations may therefore be needed. Delineators are generally suitable as precipice barriers and as a protective device between vehicular and pedestrian traffic on the site.

It is important that transport operations using motor vehicles should not stir up dust. Any bumps mean vibrations. Watering, salting and grading are examples of measures serving to alleviate such problems.

#### *Lighting*

##### **Guidance on Section 42**

Artificial lighting is needed when natural light is insufficient. Provisions on the arrangement of lighting of work places are contained in a AFS 1991:8 "Lighting".

Stand by lighting may be needed in all spaces where natural light is lacking. It can take the form of a battery-powered torch or headlamp.

##### **Guidance on Section 43**

Places involving special hazards of the kind referred to in this section include, for example, those where work with a building saw or work on the erection of scaffolding is carried out. If the light suddenly goes out during work of this kind and the natural light, if any, is insufficient, severe accidents may occur if there is no emergency lighting available.

#### **Conduct of the work**

##### *Choice of working methods and equipment*

##### **Guidance on Section 45**

In the choice of working methods, much depends on the design of the object and on the structures and building products. If new methods or materials

come to be used, it must already be considered in the planning what equipment is needed and what training and information the employees may require in order to do the work.

Building boards, building blocks, ground tiles, kerb stones, water and sewerage pipes and rolls of carpeting are some of the building products whose transport and handling may require special equipment.

**Guidance on Section 46**

When judging what equipment is suitable for the construction site, account may need to be taken to the weight, format and other properties of whatever is to be lifted or carried, of the communication routes which can be used, whether the equipment is to be used for assembly, and so on.

**Guidance on Section 47**

The National Board of Occupational Safety and Health has issued an Ordinance (AFS 1986:7) containing Provisions on vibrations from hand-held machines.

Information on vibrations and how to avoid them is contained in the Joint Industrial Safety Council's handbook on vibrations, H40.

*Instructions, inspection, etc.*

**Guidance on Section 48**

Building and civil engineering work is often done without supervisory personnel being continuously present. This makes it especially important for the employees to have sufficient training and experience to judge for themselves what needs to be done in order for work to proceed safely.

Projects can differ considerably with regard to design, structures and building products, and it may therefore be advisable, before work begins, for the individual contractor to assemble the employees for a more general review of the works to be undertaken. Information can then be supplied, for example, concerning possible deviations from normal practice and concerning special measures that need to be taken so that the work can be safely undertaken. Information of this kind can also very well be communicated to any subcontractors.

Special training or instruction is generally needed where new products or working methods are to be introduced. They may also be needed, for example, for reinforcement of structures, stabilisation works, demolition of a load-

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bearing structure and disposal of a material or substance which is dangerous to health.

#### **Guidance on Section 49**

It is appropriate for an inspection plan to be drawn up showing the devices concerned, how inspection is to proceed and at what intervals of time inspections are to be carried out.

#### *Pointed or sharp objects*

#### **Guidance on Section 52**

Pipes and reinforcement bars are a frequent cause of injury. The injuries resulting from falls onto such objects can be especially serious. Protruding reinforcement bars can be bent for safety or shielded with plastic knobs or such-like.

It is also important to observe the risk of cuts or pricks occurring during the handling/assembly of building products with sharp edges, corners or other projecting details.

#### *Transport of building products or other material*

#### **Guidance on Section 53**

Several severe accidents have occurred when improvised methods have been used for conveying materials to or from a scaffolding level or building storey.

Whatever the transport method or system used, it is important to observe the risk of falls to a lower level. General stipulations on protection against falls to a lower level are contained in Sections 57-60 of these Provisions and in the Provisions of the National Board of Occupational Safety and Health on protection against injuries due to falls (AFS 1981:14). Stipulations on the design of loading towers, load openings etc., are contained in Section 38; see also the guidance on Section 38.

Many transport operations can be done without the guardrail impeding them. If the space above a floor or scaffolding level is unobstructed, a crane can be used; the load is lowered or lifted vertically to or from the floor or scaffolding level. It is less advisable, on the other hand, for a crane to be used for conveying loads to or from a floor or scaffolding level where the load cannot be lowered or lifted vertically, because this entails unnecessary risks.

One common method of transport is to use a truck with pallet forks or a bucket. This section permits the method if the transport operation is conducted by way of a loading tower or a load opening in the façade.

Specially arranged transport systems include, for example:

- pumping devices with tubing for conveyance of bulk goods such as concrete, mortar and insulation fibres,
- prefabricated ducts for the removal of demolition waste, and
- belt conveyors and inclined lifts.

It is important for specially arranged conveying systems to be assembled so that the risk of falling to a lower level will be averted for persons working at the worksite. See also Section 49, concerning inspection.

Concerning equipment for lifting and conveying, see Section 46.

#### *Handling of waste*

##### **Guidance on Section 54**

Building and demolition waste is often pre-separated on site into several different fractions. When positioning containers for waste, it is important to ensure that adequate space is available for separation. It is also important to avert the risks associated with placing building waste in the containers and with handling of the containers in the course of transport operations.

For certain dangerous goods being transported the legislation on carriage of dangerous substances lays down special rules concerning labelling, transport documents and written instructions on safety precautions etc. Provisions on the implementation of this legislation are contained in the Statute Book of the National Rescue Services.

Provisions and General Recommendations on the handling of dangerous substances are contained in AFS 1994:2, Dangerous Substances.

#### *Storage and depositing of materials*

##### **Guidance on Section 55**

Stabilising measures may need to be taken with regard to equipment, technical devices or materials whose properties render them liable to overturn, slip or fall. Measures of this kind may also need to be taken for work with building products, materials or equipment containing stored energy, e.g. plastic tubes under constraint, pre-stressed steel, packaging strips, gas springs, spring-loaded gates etc. Severe injuries can result if the stored energy is released and somebody gets in the way.

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The packaging and other stabilising devices are often damaged during transport. Accidents from collapsing objects can be avoided if the packagings are checked prior to unloading and reception.

#### **Guidance on Section 56**

Materials with large areas mentioned in this section include, for example, building board, shuttering elements and prefabricated elements.

*Falls to a lower level etc.*

#### **Guidance on Sections 57-58**

The Ordinance of the National Board of Occupational Safety and Health on Protection Against Injuries Due To Falls (AFS 1981:14) contains the basic stipulations on measures for the prevention of such injuries. Chap. 2, Section 7 of the Work Environment Act indicates that general safety measures shall be the first resort.

Where building or civil engineering work is concerned, the risk of falls to a lower level generally needs to be prevented by means of guardrails, work platforms, cages or scaffolding when the difference in level is two metres or more. Safety devices of this kind may also be needed for smaller differences between levels, e.g. if there is a danger of the employee falling into water. Section 11 requires the work environment plan to include a description of the special measures to be taken where work entails a risk of falling to a lower level and the difference in levels is two metres or more.

A height of one metre is generally sufficient for guardrails. Depending on the nature of the work, guardrails may need to be higher.

The lining referred to in Section 57, 2nd paragraph may, for example, consist of planks or netting.

Guardrails or equipment designed to prevent falls to a lower level should be selected and assembled in such a way that they can be used with ample safety throughout the project execution stage or for as long as the risk of falls persists.

#### **Guidance on Section 59**

Falls from one storey to another have caused many injuries, both fatal and otherwise. It is of the utmost importance for a guardrail or protective cover to be installed immediately.



**Guidance on Section 60**

As regards underlay which lacks sufficient load-bearing capacity or is slippery, working methods should primarily be chosen which do not involve treading on the surface concerned. As a second resort, aids such as a gang-plank, work platform or suchlike can be used.

**Guidance on Section 60 a**

If protection against falls meets the requirements in this section but fails to meet the requirements in other stipulations in the regulations, the Swedish Work Environment Authority may issue special requirements for measures in a separate prohibition or injunction with a view to achieving sufficiently effective protection against falls. Even if a sanction charge has been decided upon, the Swedish Work Environment Authority may describe in detail in such a proactive prohibition or injunction which protective measures are required, e.g. stating that a protective guardrail shall be set up.

Note that protection against falls pursuant to the second paragraph in this section shall be designed pursuant to the general stipulations applicable for such devices, e.g. the regulations on scaffolding, ladders and trestles, personal protective equipment and the rules on guardrails and safety nets in the regulations on building and civil engineering work.

Working within the protection of guardrails, etc. means not only the actual work but also moving in connection with the work.

The stipulations of the Swedish Work Environment Authority's regulations on the use of personal protective equipment are applicable to personal fall protection systems. The fact that the lanyard shall be anchored means that the anchor point should be capable of withstanding a static load of at least 10 kN for 3 minutes. Mobile anchor points which accompany the user should be CE-labelled and meet the requirements pursuant to SS EN 795 Protection against falls from a height - Anchor devices - Requirements and testing. As regards fixed anchor points on equipment, the requirements in the standard for the relevant equipment should be met, if any such standard exists.

Occasional tasks means work which is carried out rarely and at irregular intervals.

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Number of people employed, regardless of whether they work full-time or part-time, means:

- Employees employed.
- Hired labour (cf. Chap. 3, Section 12 (2) of the Work Environment Act).

As regards enterprises without employees employed (cf. Chap. 3, Section 5 of the Work Environment Act), number of people employed, regardless of whether they work full-time or part-time, means:

- The people who run the enterprise.
- Hired labour.

The corporate registration number of the relevant physical or legal entity determines which persons are to be considered to be included in the enterprise. The number of people employed includes persons at all of the enterprise's work sites.

The number of people employed shall be calculated on the basis of information relating to the date on which the breach of the sanction stipulation was found.

Note that if there are several companies on site and breaching the stipulation, each such company shall pay a sanction charge.

#### *The workplaces*

##### **Guidance on Section 61**

In the case of worksites positioned high up or low down, it is especially important to observe the requirements of mechanical strength and stability. Work stations for assembly at a great height and work stations for foundation laying at a great depth are cases in point.

##### **Guidance on Section 62**

With adequate area and height, the employee can move more or less freely and adopt natural work postures.

Organisational measures as referred to in subsection two of this section can mean limiting the length of working spells and the total time for working day which the employee spends in the space concerned.

##### **Guidance on Section 63**

Access routes can, for example, take the form of gangplanks, stairs etc. A propped ladder is not generally a suitable access route.

A vertical or near-vertical permanently fixed ladder can be used as an access route for inspecting a roof or suchlike and also as an emergency route. It is not normally suitable as an access route to a worksite.

General Recommendations on the suitable width of access routes are to be found in the guidance on Sections 39-41.

*Climate and air quality*

**Guidance on Section 64**

The definition of a suitable thermal climate for different works depends not only on temperature but also on air currents, thermal radiation, air humidity and the intensity of work. High-precision light work, for example, requires a higher temperature than heavy, mobile work.

Atmospheric influences which can be detrimental to the safety and health of the employees include, for example, strong winds, intense heat or cold, heavy or frozen rain and heavy falls of snow. In the event of thunderstorms, the risk of lightning strikes should be taken into account.

There are special systems commercially available for covering over worksites (encapsulation constructions).

Wind augments the risk of injury from cold and frost. Strong wind, moreover, impedes the handling of materials with large areas, such as sheet metal, building board and so on. Frozen rain can cause slippery conditions and impede the handling of tools and materials.

Prolonged and/or intensive exposure of the skin to sunlight is considered to augment the risk of skin cancer, an effort should therefore be made to avoid exaggerated exposure of the skin to sunlight, especially in the middle of the day during summertime.

**Guidance on Section 65**

Stipulations on the concentrations of air contaminants which can be accepted in workplace atmospheres are contained in AFS 1996:2 Occupational Exposure Limit Values.

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### *Special risk areas*

#### **Guidance on Section 66**

Safety precautions which may need to be taken include, for example, safety shoring for the demolition of soffit formwork and temporary supports for wooden, steel or concrete structures.

Alterations to buildings often involve interference with load-bearing structures. This too can give rise to temporary fragility or instability.

During work with prefabricated structures and shuttering systems, it is important to comply with the assembly instructions which it is the supplier's duty to provide.

#### **Guidance on Section 67**

Areas where protective roofs may be needed include access and communication routes and transport routes to buildings under construction.

#### **Guidance on Section 68**

Spaces referred to include, for example, shafts, caissons, culverts, basements and suchlike. See also the guidance on Section 69. If gases form in a space of this kind and the ventilation is insufficient or if the atmospheric oxygen in the space has been exhausted by oxidation, this can endanger employees entering the space.

Internal combustion engines should not be used for work in or near a shaft or well, owing to the risk of exhaust fumes and oxygen deficiency.

Emissions from air conditioning plants, gas cylinders, transport operations etc., can create a hazardous area in the vicinity. Special caution may need to be observed when gases heavier than air accumulate in low-lying areas.

A space should be aired by supplying clean air with the aid of a fan, compressor or air cylinder.

#### **Guidance on Section 69**

Spaces referred to here include, for example, sewerage or gas mains, silos, material containers, wells, cisterns and suchlike.

Air normally contains 21% oxygen by volume. A lower percentage of oxygen has an adverse effect on the employees. At oxygen contents of 15-17% by volume, symptoms such as fatigue and increased pulse rate occur. If the oxygen

content falls further, there is a risk of asphyxiation. If the oxygen content of the air exceeds 21% by volume, flammable substances would ignite more easily, which augments the risk of fire. Other circumstances which can augment the risk of ignition are contaminants of flammable gases or substances in the air.

Suitable measures for providing fast and effective assistance may, for example, be hoisting equipment for retrieving employees working in silos, cisterns, material containers and suchlike.

General Recommendations on work in confined spaces are contained in AFS 1993:3.

**Guidance on Section 70**

The risk areas which may be involved include those, for example, where asbestos clearance is carried out or where mineral wool insulation is being sprayed. They may also include areas where paint is being applied which contains organic solvents or thermosetting plastic components. Still other areas include, for example, those where loud noise or welding flashes occur.

*Personal protective equipment*

**Guidance on Section 71**

Chap. 2, Section 7 of the Work Environment Act prescribes as follows: "Personal protective equipment shall be used when adequate security from illhealth or accidents cannot be achieved by other means". This stipulation is based on the idea of the workplace primarily being designed so that personal protective equipment will not be needed. The same section makes the provision of personal protective equipment the employer's responsibility.

Other personal protective equipment which can be needed for building or civil engineering work includes, for example, safety gloves, hearing protectors, respiratory protection, eye protectors, fall arrest devices and protective clothing. A life jacket may also be needed, e.g. for work on bridges.

Stipulations on life-saving devices where there is a risk of drowning are contained in Sections 9 and 11 of the Ordinance of the National Board of Occupational Safety and Health (AFS 1981:14) on Protection Against Injuries Due to Falls. See also the Board's Ordinance (AFS 1982:3) on Solitary Work.

People can be temporarily present on a construction site without actually carrying out building or civil engineering work. This is the case, for example,

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with a driver delivering building products to a housing construction site or asphalt for road construction. It is essential that these persons should also be informed of the hazards of the construction site and of the importance of wearing the necessary personal protective equipment. The ultimate responsibility for identifying the risks and issuing instructions rests, however, with their employers.

App. 2 contains a list which may furnish guidance for the selection of personal protective equipment.

#### **Certain particular kinds of work**

##### *Earthwork*

The stipulations in this part are particularly concerned with earthworks. Work of this kind is also subject to other stipulations of these Provisions where applicable, e.g. Sections 23-25, 38-44, 46, 53 and 63.

#### **Guidance on Sections 72 and 74**

In order to meet the requirements of this section, the nature of the ground generally needs to be known before work begins.

The work environment plan shall indicate the special measures needing to be taken (see Section 11). For deep excavations and where ground conditions can be expected to cause difficulty, it is important that the need for slope gradients, supportive structures or other reinforcement measures be calculated and assessed before earthworks are commenced. This calculation and assessment should be carried out by someone with the requisite knowledge of soil mechanics. If changes occur on the worksite or if the particulars in the building documents prove to be incorrect, the assessment may have to be revised.

Where excavation is on such a scale as to involve a risk of collapse causing injury to personnel, it is important that the ground surrounding the excavation should be continuously checked for subsidence or cracks. For deep excavation inside sheet piling, special monitoring and alarm systems may need to be used to achieve adequate safety.

Recommendations on excavation work are contained in the Board's manual "Gräv säkrare!" and "Schaktning i jord".

**Guidance on Section 75**

Piles of earth should not be deposited less than 0.5 metre from the edge of the excavation, due to the risk of collapse. This margin is needed to prevent the inrush of stones and other material into the excavation. Sometimes a screen may need to be put up to exclude soil, stone, tools etc. from the excavation.

To ensure that the excavation does not collapse from overloading, a far greater margin than 0.5 metre is usually needed. The safe distance must be calculated with reference to excavation depth, materials in the ground, water table etc.

*Demolition work*

The stipulations in this part are particularly concerned with demolition work. Work of this kind is also subject to other stipulations of these Provisions where applicable, e.g. Sections 19, 23, 24, 48 and 60.

**Guidance on Sections 78-80**

For the demolition of load-bearing structures or materials or substances dangerous to health, Section 11 requires the work environment plan to include a description of special measures. A description of this kind demands a good knowledge of the object to be demolished, as regards both the materials and substances included and the structural objectives of the building or civil engineering works itself. Even in cases where building documents are still extant, inspections of the building or installation may be necessary, because it may have changed while in use, added to which, changes may have occurred in the bearing capacity of load-bearing parts.

It is natural that the work environment plan should, for example, indicate:

- the structural system of the object,
- the materials which the object includes,
- special safety and stabilisation measures which may need to be taken,
- the order in which demolition can be carried out, and
- how materials and substances dangerous to health can be disposed of.

The inclusion of these particulars in the plan will facilitate planning of the demolition work.

Note that Sections 78-80 also apply to "internal" (indoor) demolition, e.g. of partition walls, heating and plumbing installations and so on.

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Demolition of sewerage systems, flooring fill and suchlike can entail an infection hazard. Work in hospitals, laboratories and suchlike can be especially hazardous. In situations of this kind it is appropriate to contact the person within the operation who is responsible for anti-infection precautions. When choosing personal protective equipment for this kind of work, it is important to take account of the special conditions in protective respect which may be involved.

Even with careful planning, unexpected risk situations are liable to occur, hence the stipulation of competent personnel for work referred to in Section 79.

Chap. 9 of the Planning and Building Act (SFS 1987:10) contains detailed stipulation concerning the documents and permits required under that Act for demolition.

#### *Passing vehicular traffic*

##### **Guidance on Section 81**

Note that the stipulations concerning passing vehicular traffic apply to all kinds of building and civil engineering work.

Passing vehicular traffic occurs, for example, in connection with the maintenance and repair of roads and traffic machinery – bridges, for example – the widening of existing roads, and so on, but also in connection with the construction and maintenance of a building close to a road or street. Needless to say, the construction of a new road also comes under the stipulations of Sections 81-86 if there is vehicular traffic passing by. Note, moreover, that these stipulations also apply to passing track-bound traffic (see Section 3).

Work on or near a road, street or track area where there is liable to be vehicular traffic involves special risks. One cause of serious work injury is the employee being struck by a vehicle. In addition, employees are exposed to exhaust fumes, noise, vibrations and light from passing vehicles, which affects them both physically and mentally. Exposure to exhaust fumes from passing vehicles will be reduced if the traffic can be kept moving without tail backs.

Vehicular traffic connected with transport operations on the construction site for purposes of the building or civil engineering work is not dealt with here but in Sections 38, 40 and 41.



The person commissioning or undertaking building or civil engineering work does not normally have full control over passing vehicular traffic. Implementation of the measures indicated in this section will therefore generally require the assistance of road authorities (or the equivalent) and/or of the appropriate public authority. Stipulations on this point are contained in road traffic legislation. The Road Signs Ordinance (SFS 1978:1001), for example, contains stipulations on the way in which road signs and other devices are to be erected (traffic arrangement plan) and on authority to do so.

As regards works of the kind involved here, Section 12a requires the work environment plan to contain a description of the special measures to be taken at the project execution stage so as to achieve acceptable safety and health conditions. It often comes naturally for the traffic arrangement plan, if there is one, to be made part of the work environment plan.

**Guidance on Section 81 (b)**

Safe clearance has to be defined for each individual case, with reference to traffic intensity, noise, vibrations, air pollution etc. It will also depend, of course, on the speed of passing vehicles; Cf. (d) in this section.

**Guidance on Section 81 (c)**

The capacity of safety devices for excluding or diverting traffic from the worksite will depend on how they are designed and positioned. If they are positioned close to the worksite, they will have to be heavier and more strongly anchored to provide adequate safety. If a vehicle is used as a protective device, it should be provided with energy absorption equipment.

The Road Signs Ordinance contains stipulations on the design of closure devices, indication screens and indication arrows for showing that, on account of roadworks or for some similar reason, a road is partly or wholly closed to traffic or that it is obstructed.

In certain cases conditions may be so favourable that a closure or protective device would not appreciably reduce the risks to safety and health. In such cases these devices can of course be dispensed with unless otherwise indicated by the Road Signs Ordinance or the Provisions of the National Road Administration (formerly the National Road Safety Office). Another point to be remembered is that some works are of such brief duration that putting out and removing closure or protective devices entails more risk of being struck by vehicles than the work itself.

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It is generally a good idea for work to be undertaken during low-traffic periods. This reduces the hazards, partly because approaching vehicles are then easier to spot. In particular, works of brief duration should be done at such times.

#### **Guidance on Section 81 (d)**

The speed of passing vehicles has an important bearing on safety. Low speed reduces the risk of vehicles inadvertently invading the worksite. It also reduces the effects of noise, vibrations and light on the employees, and so it is always a good thing if arrangements can be made for vehicles to pass at the lowest possible speed.

#### **Guidance on Section 81 (e)**

Under Section 76 of the Road Signs Ordinance, traffic can be controlled by a signalman in connection with roadworks and suchlike. See also the remarks above concerning assistance from the road authority (or the equivalent) and/or from the appropriate public authority.

Spells of duty for the signalman should be appropriate to conditions on the site and to the traffic involved.

#### **Guidance on Section 82**

The authority in charge of the track area will as a rule have issued special rules on the marking of worksites on or near busy lines.

#### **Guidance on Section 83**

Situations when vehicles may need to pass through a place or area where building or civil engineering work is carried out are above all connected with work on or near a railway line or suchlike. But situations of this kind can also occur, for example, in connection with roadworks. Both technical and organisational measures may need to be taken.

Technical measures in connection with work on a track area include, for example, the use of an ATC system if there is one. Organisational measures include, for example, posting a guard to keep the risk area under observation and to ensure that the employees leave it when a vehicle approaches. The reason why both technical and organisational measures can be needed is that adequate safety is hard to achieve with one kind of measure only.

**Guidance on Section 85**

Stipulations on the posting of guards for roadworks and in suchlike conditions are contained in the Road Signs Ordinance (SFS 1978:1001).

Warning clothes are personal protective equipment designed to make personnel in a risk area more conspicuous. Clothing of this kind includes, for example, dazzle vests, overalls, jackets, trousers or waterproof clothing with reflective and fluorescent patches.

*Work on roofs*

The stipulations in this part are particularly concerned with work on roofs. Work of this kind is also subject to other stipulations of these Provisions where applicable (e.g. Sections 55, 56, 59, 60 and 63).

**Guidance on Section 87**

Stipulations on access and communication routes are contained in Sections 38-40, 49 and 63. The permanent roof access devices which are usually to be found on existing properties, e.g. roof hatches and removable ladders, do not normally correspond to the requirements applying to building and civil engineering work.

Falls are a common cause of work injury in connection with work on roofs. They are often preceded by the employee slipping or tripping or by the underlay giving way. Wind and weather are often a contributory cause of these accidents. Low temperatures affect people and, not least when combined with uncomfortable work postures, can result in reduced muscular function, stiffness and clumsiness. This means a heightened risk of both accidents and ill-health, e.g. of musculoskeletal injuries.

If the gradient of the roof exceeds 1:2 (about 27°) and the work is not of brief duration, foot supports are normally necessary to prevent ill-health resulting from unsuitable work postures. See also Section 90.

**Guidance on Section 88**

Often it is impossible to design a guardrail which will provide acceptable protection and at the same time allow work to be done on eaves or other roof edges. The normal alternative in cases of this kind is often scaffolding or a work platform, either fixed or mobile. If mobile equipment needs to be used, it is important to check the suitability of the ground for this purpose, e.g. as regards load-bearing capacity and accessibility.

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For certain types of work on eaves or other roof edges, it may be reasonable to use a mobile work platform for some operations and personal fall arrest equipment for others.

A mobile work platform can be appropriate in connection with the fitting of a guardrail or equipment for roof work.

Scaffolding is very often erected for façade work. If so, it is appropriate to plan the work so that this scaffolding can also be used for work on or near eaves or other roof edges and as a fall protection device in connection with the other roof work. Ergonomic considerations may necessitate rebuilding or otherwise adapting the scaffolding to suit different work stages.

Note the stipulations of Section 57, 2nd paragraph and 67 concerning precautions against falling objects.

#### **Guidance on Section 89**

The National Board of Housing, Building and Planning, exercising powers conferred by building legislation, has issued stipulations on the design and construction of permanent access and safety devices on roofs which can be walked on.

#### **Guidance on Section 90**

Work on an inclined surface entails unnecessarily strenuous work postures. It also aggravates the risk of accidental falls due to slipping.

Work undertaken in a small area and capable of lasting for more than 4 hours includes, for example, the sheathing of dormer windows and chimneys.

#### **Guidance on Section 91**

It follows from the general stipulations of the Work Environment Act on responsibility for safety and health that the employer is responsible for the roof being examined before repair or maintenance work begins. This duty of investigation also applies, of course, concerning the existence of such dangerous substances as asbestos, lead, quartz etc.

There is, for example, a risk of personnel falling through roofs of corrugated asbestos cement sheets, which are liable to become brittle with the passing of time. Sheets of this kind occur on old outbuildings and warehouses.

The load-bearing capacity of a roof can be judged by testing or calculation. For purposes of such testing or calculation, one person carrying a light load can be presumed to weigh about 120 kg.

**Guidance on Section 92**

To meet the requirement in the first sentence of this section, the packages may need to be ordered with a certain number of sheets per package. For the guidance of crane drivers and fitters, packages should be marked with the weight and covering width of the sheets they contain. The packages can then be distributed at the appropriate intervals corresponding to the covering area of the sheets in the package.

**Guidance on Section 92 a**

If protection against falls meets the requirements in this section but fails to meet the requirements in other stipulations in the regulations, the Swedish Work Environment Authority may issue special requirements for measures in a separate prohibition or injunction with a view to achieving sufficiently effective protection against falls. Even if a sanction charge has been decided upon, the Swedish Work Environment Authority may describe in detail in such a proactive prohibition or injunction which protective measures are required, e.g. stating that a protective guardrail shall be set up.

Note that protection against falls pursuant to the second paragraph in this section shall be designed pursuant to the general stipulations applicable for such devices, e.g. the regulations on scaffolding, ladders and trestles, personal protective equipment and the rules on guardrails and safety nets in the regulations on building and civil engineering work.

Working within the protection of guardrails, etc. means not only the actual work but also moving in connection with the work.

The stipulations of the Swedish Work Environment Authority's regulations on the use of personal protective equipment are applicable to personal fall protection systems. The fact that the lanyard shall be anchored means that the anchoring should meet any of the following conditions:

1. the anchor point should be capable of withstanding a static load of at least 10 kN for 3 minutes, or
2. mobile anchor points should meet the requirements of standard SS-EN 795 Protection against falls from a height – Anchor devices, or

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3. fixed anchor points on equipment, e.g. scaffolding, mobile work platforms, etc., should meet the requirements of the standard for the relevant equipment, if any such standard exists, or
4. the anchor device should be capable of passing the dynamic testing as described in standards SS-EN 516 and SS-EN 12951 (see below).

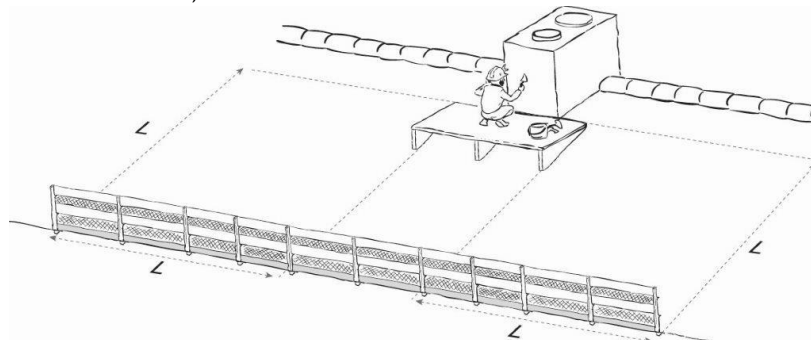
As regards dynamic testing, the following standards are available in early 2014 in which such testing is described:

- SS-EN 516:2006 Prefabricated accessories for roofing – Installations for roof access – Walkways, treads and steps.
- SS-EN 12951:2004 Prefabricated accessories for roofing – Permanently fixed roof ladders.

Products which are capable of passing dynamic testing are:

- Catwalks class 2 pursuant to SS-EN 516 (class 1 is unable to withstand a tug from a safety lanyard).
- Roof ladders class 2 pursuant to SS-EN 12951 (class 1 is unable to withstand a tug from a safety lanyard).
- Roof ridge rails and eaves rails pursuant to SS 83 13 31 Roof protection – Roof ridge rails and eaves rails – Functional requirements, version 3.
- Low guardrails around skylights and roof hatches pursuant to SS 83 13 33 Roof protection – guardrails – Functional requirements, version 2.
- Snow rails pursuant to SS 83 13 35 Roof protection – Snow rails – Functional requirements, version 2.

If a protective guardrail is set up only along part of the eaves with a view to providing fall protection for a restricted area in which work shall be carried out, the guardrail should extend outside the work area at least as far as the distance in the direction of the pitch from the guardrail to the highest point of the work area; see the illustration.



Examples of areas in which there may be a risk of treading through include roof decking which was not designed to be walked on, old asbestos cement roofs, glass roofs or plastic roofs. Old asbestos cement roofs and plastic roofs are often brittle.

Blocking or roping-off means something which does not need to meet the requirements for protective guardrails, but which makes it clear to everyone on the building site that the area behind the blocking or roping-off must not be entered. Thus blocking or roping-off should be clear, and signs should sometimes be used. See the Swedish Work Environment Authority's regulations on signs and signals with regard to labelling of blocking or roping off. It is important for the blocking or roping-off to be durable so that it is not destroyed by the elements, etc.

The term "number of people employed" is explained in the guidance to Section 60 a .

### **Safety nets**

#### **Guidance on Section 93**

Note that the stipulations of Section 93 are addressed, not only to manufacturers, importers etc., but also to those who use safety nets in the course of their activities.

Safety nets are normally made of polyamide or polypropylene. A safety net meeting the requirements of standard SS-EN 1263-1, Edition 1, can be taken to meet the requirements of this Section.

It may be appropriate to mark the net with the name or logotype of the manufacturer or importer and with the year and month of manufacture. Cf. point 8 of SS-EN 1263-1, edition 1.

It is clear from Section 3 that the term "safety net" includes both the actual net and its suspension devices. These suspension devices may, for example, consist of a border rope with tie ropes or consoles of different kinds. (See the above mentioned standard).

The capacity of a safety net for catching a falling person can be described as its capacity for absorbing the energy which the falling person represents. The

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principle is that the net is stretched sufficiently to restrain the fall gently enough for the person not to be injured.

A person weighing 100 kg who has fallen freely for 7 metres, counted from the body's centre of gravity before the fall (i.e. a drop of 6 metres from foot level) before striking the net represents 7 kJ energy. This is the energy which the net has to absorb without breaking so much that the person falls through it. This external energy striking the net is matched by "internal work" in the net which, simplifying matters, can be described as the sum total of the inner forces multiplied by the stretching of the different parts of the net. Thus all parts of a net affected by a fall need to be able to withstand the forces they are subjected to and to stretch sufficiently.

Generally speaking, the energy absorption capacity of a safety net depends on the tensile strength and extensibility of its parts (meshes, border ropes, suspension structure), the size of the net and the way in which it is suspended. A small net is less resilient than a large one and has less energy absorption capacity. This being so, a net cannot automatically be divided into smaller parts on the assumption of every such part being able to absorb the same amount of energy as the original large net. Safety can also be jeopardised if the net is suspended in another way than it is designed for. A safety net intended for suspension with a border rope and tie ropes, for example, will be less extensible if hung up on tubes or consoles.

The energy absorption capacity of a safety net is also affected by ageing. This is accelerated when the net is exposed to ultraviolet radiation from sunlight; see also the guidance on Section 98. A reserve of energy absorption capacity is therefore needed for the duration of the net's useful life, i.e. up to the date when, according to Section 98 (b) or (c) or Section 99, it may no longer be used.

#### **Guidance on Section 94**

Important points in the instructions for fitting the safety net are the maximum intended falling height for different parts of it, the minimum clearance needed below the net, anchoring forces required, joint procedure for nets etc.

Factors which can have a detrimental effect on the working of the net are e.g. high or low temperatures and chemicals.



**Guidance on Section 95**

A test rope may be a separate length of the rope which the safety net is knotted or composed of or a number of continuous meshes of the same fabric as the safety net. In both cases the rope/meshes are secured to the net and are detached before test-pulling. A safety net conforming to standard SS-EN 1263-1, is required by that standard to have at least 1 test rope.

A more detailed description of the system of test ropes will be found in the General Recommendations accompanying Section 98.

In order to decide when a net no longer affords adequate protection, one needs to know the minimum acceptable test-pull result. It is important for this level to be set with an ample margin. It can be described, for example, by indicating the minimum tensile strength, margin included, which a test rope, and accordingly the net as well, needs to have so as to afford adequate protection.

For a net with only one test rope, information is also needed as to how the test-pull result is to be used in determining any remaining time during which the net is certain to afford adequate protection. The instructions may, for example, indicate how much longer the net can be used at the different strength values which may result from the test pulling.

For a net with several test ropes, fixed intervals of time, for example, can be given between the test pulls, together with a minimum tensile strength reading for each pull. At every test pull, the result is compared with the minimum value stated in the instructions. If the outcome of the comparison is positive, the net can be used until it is time for the next test pull. If the outcome is again positive for the final test pull, the instructions also need to show how long the net will continue to afford adequate protection. (Cf. previous paragraph).

Should any test pull show that the safety net no longer affords adequate protection, Section 98 requires it to be taken out of service.

Further information about test-pulling and how to calculate the useful life of safety nets will be found in section 7.5.3 of the standard SS-EN 1263-1, edition 1.

**Guidance on Section 96**

Note that with certain kinds of safety net, the maximum intended drop can be less for certain parts of the net than for the middle of it. The CEN TC53

### **AFS 1999:3**

“Temporary Works Equipment” committee within the European Committee for Standardisation has drawn up a standard, Safety Nets – Part 2: Safety requirements for the erection of safety nets (EN 1263-2). This standard is published in Sweden named “SS-EN 1263-2 Skyddsnät – Del 2 – Säkerhetskrav, uppsättning”. This provides information on falling heights and other information about installation, use and dismantling of safety nets in compliance with standard SS-EN 1263-1, edition 1.

Objects which may be present under the net include, for example, equipment and vehicles.

#### **Guidance on Section 97**

If a person or large object has fallen into a safety net, there may be residual deformation which impairs the net’s efficiency. In addition, meshes may have been partly or wholly torn.

#### **Guidance on Section 98**

A safety net ages, especially when exposed to ultraviolet radiation. This ageing reduces the extensibility of the meshes. The tensile force of the meshes will then be greater when the safety net is subjected to the load of a falling person than it is in a net which has not been affected by ageing. Eventually the meshes will no longer be capable of sustaining the load.

New safety nets, when delivered by the manufacturer, have extra energy absorption capacity so that, in spite of the ultraviolet radiation they can be exposed to in the form of daylight, they will afford adequate protection for a certain time after their manufacture date. For nets meeting the requirements of standard SS-EN 1263-1, edition 1, this time is 12 months.

A safety net can be said to have a “use by date”. For a safety net with no test ropes, this date is worked out by adding to the date of manufacture the length of time for which the net is estimated to retain its protective function (see Section 95, 2nd paragraph and Section 99, 3rd paragraph).

For a net with one or more test ropes, the “use by date” is the latest day when, according to the instructions, a test rope is to be test-pulled (Section 95, 1<sup>st</sup> paragraph compared with Section 98). Conditions during the period elapsing between the date of manufacture and the “use by date” may, however, have been more favourable than the manufacturer calculated for, in that the ultraviolet radiation during use has been less than was assumed or the net has

been out of service for a time and during that period was not exposed to ultraviolet radiation. There may then be a sufficient reserve of energy absorption capacity for use to continue some time after the "use by date". This contingent reserve can be used if the net is provided with at least one test rope. If a test rope is test-pulled and the reserve proves adequate, the net can be used for the length of time indicated by the test results and the instructions, e.g. until it is time for the next test-pull. In this way the test result can be used to work out a new "use by date" for the net which will be later than the original date given. See also the guidance on Section 95.

It is important for the test-pull to be conducted by a test laboratory which has the competence and equipment for the task.

Concerning nets with several test ropes, special account should be had of the following. Any continued use of the net after a test-pull is conditional on appraisal of the test result showing that the safety net still provides adequate protection – see Section 98 (b) – and the existence of a reserve for the period ending with the next test-pull or for a "use by" time, the length of which will be determined by the procedure indicated in the instructions; see Section 98 (c). Under Section 99, after this latter period has passed, the safety net may not be used.

**Guidance on Section 100**

The background to the requirements in this section is as follows. At temperatures below -10°C, a number of polymer materials used in the manufacture of safety nets are prone to embrittlement. The material then loses the energy absorption capacity needed for the safety net to retain its protective function. It is therefore important to ascertain that the material in the net can withstand the temperatures at which the net is to be used.

**Guidance on App. 1**

There may be, at most, two client's delegees at any given time: one for planning design and one for the execution of the project. Similarly, there may only be two building work environment co-ordinators: one for planning and design and one for the execution of the project.

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**App. A**

**Examples of suitable personal protective equipment**

<b>Risk</b>	<b>Examples of risk situations</b>	<b>Examples of suitable PPE</b>
Head injury	Falling objects, crush/press injury	Industrial helmet, tested to EN 397 and marked "LD" (improved me- chanical rigidity) "440Vac" (electrical insulation) "-20o -30o(intense cold).
Foot injury. Crushing/pressing of feet. Slipping. Treading on nail. Frozen feet.	Falling objects. Slippery surface. Sharp objects. Cold climate.	Safety shoes with toe caps (standards EN 344 and 345), marked "SBII" basic require- ment "S1-S5" supplemen- tary requirement "P" penetration re- sistance "CI" thermal insula- tion
Eye injury.	Splashing of con- crete/mortar Flying particles, dust. Welding flashes.	Eye protectors. Face mask or wrap- around safety glasses. Welding mask.
Hearing damage.	Noise, where the equivalent sound level for an 8-hour working day exceeds 85dB(A). Particularly sensitive persons may also be in danger of hearing damage at levels down to 75dB(A).	Earmuff or ear plugs tested, respectively, to EN 352-1 and EN 352- 2. Choose protection appropriate to the noise level and fre- quency content.

Risk	Examples of risk situations	Examples of suitable PPE
Fall to a lower level.	Guardrails lacking or cannot be used owing to the nature of the work. Simple temporary works	Fall arrest system as per EN 363. Equipment with support and fall prevent function as per EN 358.
Oxygen deficiency	Work in wells and tunnels	Respiratory protection in the form of compressed air line breathing apparatus.
Injuries to respiratory organs	Demolition work entailing a risk of infection or involving substances dangerous to health	Respiratory protection in the form of a full mask or half-mask, with relevant filters. The equipment may also comprise a filter respirator fitted with a fan. Compressed air equipment.
Hand injury	Sharp objects, chemicals, low/high temperature	Protective gloves appropriate to the risks involved.
Vehicle impact	Passing vehicular traffic.	High-visibility warning clothing as per EN 471.
Hypothermia	Work at low temperatures.	Thermal protective clothing as per ENV 342 or ENV 343.
Drowning	Work on bridges or pontoons.	Life jacket as per standard EN 399-275N or EN 395-100N.