

HSE Handbook

for AF employees and partners



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Foreword

At AF one goal comes before anything else, namely that all employees, suppliers and partners will go home each day without injury. For us this is a matter of values. No financial results or project challenges are worth a person's health and life. If an assignment cannot be carried out in a safe manner, then it should not be carried out at all.

This clear goal is an obligation for us all as managers, employees, suppliers and partners. We must plan and perform our work in a way that there is no harm caused to people, equipment or the environment. Such a goal is only achievable if everyone, both individually and collectively, accepts a daily responsibility for the HSE work in all our projects.

A strong focus on HSE is created through several elements. Good order and tidiness, proper use of personal protective equipment, well planned tasks, compliance with established procedures and the active identification and management of all HSE risks.

We must therefore be clear and uncompromising in our approach to health, safety and the environment. So take the best care of yourself and demonstrate through your actions that you care about others. In this way we can achieve safer and more pleasant workplaces for everyone.

Amund Tøftum, CEO



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AF wants to have safe workplaces where we create value and develop together in a wholesome way.

Everyone comes home unharmed at the end of the workday.

No one falls ill or suffers from health problems caused by working.

Climate and the environment are not subject to needless strain.

Our behaviour reflects our positive attitudes to health, safety and the environment (HSE)



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Safe Job Analysis

The Safe Job Analysis (SJA) is the most frequently used tool at AF for managing HSE risk. We want to influence risk in order to avoid accidents, health problems and disease. Through the SJA we find the safest and most appropriate way to complete a task.

Anyone taking part in a particular task must participate in the SJA, or at least receive a thorough review of the SJA prior to start-up.

The most important elements in a SJA:

- What can go wrong?
- Why can it go wrong?
- How can we prevent it from going wrong?
- Define responsibilities for barriers which prevent things from going wrong
- Who is responsible for the barriers which prevent things from going wrong?

Always make sure to include relevant basic material when carrying out a SJA. This includes user instructions, previous risk analyses, drawings, procedures, etc.



Inform your immediate manager if you think that a SJA should be done before commencing an operation.

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Safetalk

Safetalk is a professional buddy check! It is a simple chat about risks and what could go wrong that can be done by anyone, anywhere, anytime. A safetalk is meant to raise people's awareness about HSE risks and benefit from each individual's combined knowledge and experience. Everyone should feel safer and that they have a good overview after having had a safetalk, and the goal is to avoid accidents and harmful strains.

How to conduct a safetalk

Safetalk is a simple chat that can last from one to five minutes and that should be carried out on your and your colleagues' terms. You decide when and where you will talk, as long as you conduct the conversation in a way that you are satisfied with. A good safetalk is characterised by mutual respect and open dialogue. We should always ask if it's okay to have a safetalk – never demand one. We should react positively if someone asks us for a safetalk. We should help each other remove any risks and work for mutual benefit and be good listeners. Safetalks should preferably involve two or three people, not big groups.



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Safetalk questions

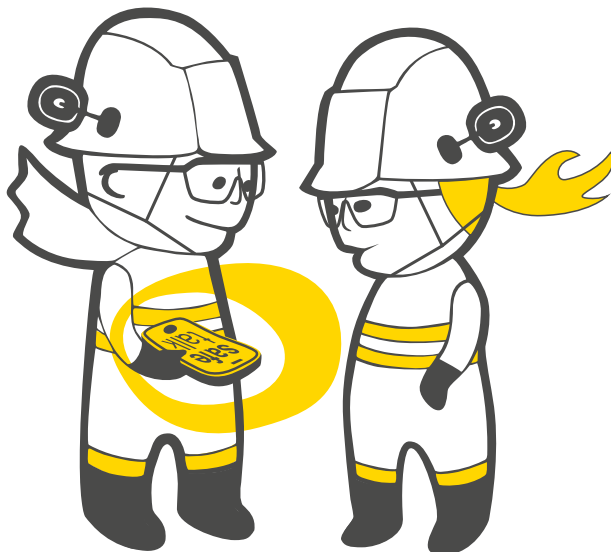
The chat should be based on inspiration from one or more safetalk questions:

- 1 Can we get injured here?
- 2 Can we endanger anyone else?
- 3 What could go wrong?
- 4 What are the most important safety measures?
- 5 How can we work in an even safer way?

Registration

A safetalk is registered either with a safetalk note or by using the app available here:

www.safetalk.no
alternatively safetalk.afgruppen.no



Conduct a safetalk with a colleague or two if you feel insecure or unsafe before or during your work.

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Barriers

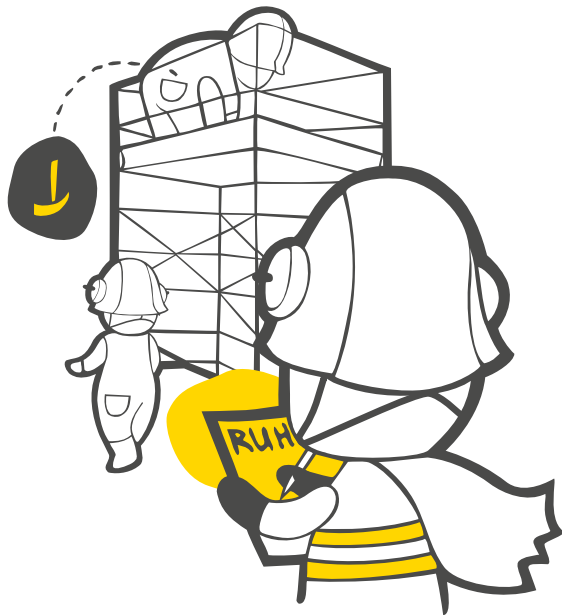
Barriers are measures to prevent HSE risks leading to accidents or health problems/illness.

AF uses both physical and organisational barriers. All critical work operations must be protected by at least two independent barriers. If one barrier fails, the other will still prevent an accident. We must endeavour to ensure that at least one of the barriers is physical.

Reporting of undesirable incidents

All accidents, near misses, observations and undesirable health issues must be reported. All reports will be investigated so that we learn from events, learn from each other and in this way avoid accidents, health problems and illness. Feedback on which barriers that will be implemented, is given in meetings, notices etc.

It is very positive for AF that everyone contributes to the reporting of undesirable incidents (RUI), and no one should experience negative feedback or repercussions when reporting.



Write a RUI if you observe HSE conditions that could be improved, and take particular care to report hazardous conditions, near misses and accidents.



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Personal protective equipment

The type of protective equipment must be risk assessed for the work to be carried out.

Workwear

The minimum clothing is long work trousers and t-shirt. The workwear must satisfy the project's requirements for visibility (class 1, 2 or 3) and high visibility clothing must as a minimum cover the torso. Further consideration must be given to the type of workwear that is appropriate and approved for the job, in order to provide adequate protection (mechanical, cold, heat, rain, chemicals, etc.). For AF employees the workwear must comply with the AF design manual.

Protective footwear

It is mandatory to wear safety shoes of the type EN ISO 20345 as a minimum. The protective footwear must meet the project's protection requirements. Protective footwear must fit the user and be suitable for the area of use to avoid injury and unwanted strain. Hightop safety shoes are recommended for better stability to prevent ankle strains and injuries. For slippery surfaces and winter conditions, slip-resistant soles are recommended (high rubber content and deep profile in the outsole). Wear crampons or studded safety shoes if necessary.

Leg protection

When using a chainsaw, use suitable protective trousers with sewn-in leg protection and safety boots.

Safety helmet

Safety helmets are mandatory for all AF projects. An industrial climbing helmet (EN 397 + EN 12492) is recommended. The helmet must be equipped with hearing protection and chinstrap. The chinstrap must be used. In addition, the helmet must be labelled with the name of the company and the wearer and may not be worn after the helmet expiry date. Machine operators must have a helmet with them in the machine and they must put on the helmet before getting out of the machine.

AF colour codes for helmets:

- White: Skilled workers
- Green: Safety representatives
- Yellow: Line Management and staff (officials)
- Blue: Visitors

For individual projects there may be deviations from this because the client uses different colour codes.



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Eye protection

It is mandatory to wear safety goggles on all AF projects. There are many types of eye protection available so it is important to wear the right type for the task involved. Some work operations require tight-fitting eye protection and goggles, such as for cutting, grinding, drilling and sawing work or when working with chemicals or fresh concrete. When there is a need for full face protection, such as when working with splashing liquids or electric arc discharge, face shields must be worn.

All eye protection is marked with areas of use and level of protection, such as mechanical resistance, liquid and dust particles. Visors are approved as safety goggles. However, AF recommends the use of ordinary safety goggles because it is our experience that it is easier to use visors incorrectly and that such usage has historically resulted in eye injuries.

Conventional glasses cannot replace safety goggles. Contact your immediate supervisor if you need safety goggles with optical strength. Goggles designed to be worn over glasses can also be an attractive option.

Hearing protection

Hearing protection must always be mounted on the helmet and must be used when exposed to noise exceeding 85dB(A) during an ordinary workday or in the event of powerful

impacts/ impulse noise. A rule of thumb is that if it is difficult to hear a conversation at a distance of one metre, you must wear hearing protection. In some cases, the wearing of double hearing protection should be considered. For more information about noise, see the **Health** chapter.

Protective gloves

It is mandatory to wear protective gloves on all AF projects. A wide range of protective gloves are available, and it is important to wear the right type of gloves for the work being performed. For example: mechanical impact, handling of chemicals and hot work. When working with rotating tools or near moving mechanical components, gloves with low tear resistance are recommended. The glove must tear apart easily if it gets stuck. The correct glove size is essential. Read the manufacturer's user instructions for tools and machines.

All protective gloves are marked to indicate the type of work they are suitable for and the level of protection provided, such as cutting resistance, protection against heat, flames, low temperatures and hazardous chemicals. Good gloves must be user-friendly, flexible, comfortable and fit properly.



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Headlamp/portable light

For work and travel in areas without adequate lighting, employees will be equipped with portable lights or headlamps. When working and travelling underground, employees will as a minimum be provided with an appropriate headlamp. Visitors to tunnels must have a portable light and/or headlamp and be accompanied by a responsible manager.

Respiratory protective devices

Respiratory protective devices serve as a barrier against the inhalation of particles and vapours and must be worn if the air contains harmful amounts of gases, dust, solvents or similar.

Respiratory protective devices come in many varieties, but we can narrow these down to three main types:

- 1 Passive masks where the mask itself or a filter in the mask filters the air you breathe in
- 2 Powered breathing apparatus with overpressure where air is filtered either in the mask itself or in a filter cassette on the back
- 3 Self-contained breathing apparatuses (SCBA, overpressure) which supply fresh air from another source (pressurised tank or compressor)

There are three main types of filter:

- Dust filter for particle dust (also filters out vapour in droplet form)
- Gas filter for gases and vapours
- Combination filter for dust, gases and vapours

Dust filters do not filter out gases or vapours.

At AF, all dust filters must be class P3.

For more information about dust, chemical products, hot work and gases, see the **Health** chapter.



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Fall protection equipment

When working at heights above one metre and where there is a risk of falling to a lower level, fall protection equipment must be worn. The fall protection equipment must be adapted to the working situation to provide the best possible protection, and there must be a rescue plan for each situation. Rescue equipment must be available at the workplace.

The equipment must be periodically inspected at least once a year or more often if necessary. Inspections must be done by a qualified individual. In addition to periodic inspection, the user must always inspect the equipment himself/herself before and after use.

All employees using personal fall protection equipment must have completed documented training in how to use and be rescued from a harness.

The following applies to employees using fall protection equipment:

- At least two people must be present
- A rescue hoist with a suitable working length must be available at the workplace
- Fastening points should be able to hold a minimum of 15 kN or more, if required by the equipment manufacturer (such as when using a horizontal safety line)
- Ensure free fall clearance to avoid hitting the ground or structures in the event of a fall
- When working in ropes (access technique), workers must be certified to the requirements of NS 9600 – Rope access techniques
- Underlying areas must be secured and cordoned off
- One should prioritize fall restraint before fall arrest

Lifejacket

Lifejackets must always be worn when working over or near open water. Inflatable lifejackets are permitted, provided that they are adequately maintained and inspected before use. The risk analysis for a project determines type-specific requirements for lifejackets.



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Barriers and signage

The following work operations usually require the area to be cordoned off:

- Working at heights and the assembly/disassembly of scaffolding
- Core drilling work (other side of a wall or subjacent storey)
- The use of aerial work platforms (AWP)
- The use of radioactive sources (dedicated barrier equipment with black radiation symbol)
- Demolition work
- Work with PCBs, asbestos and hazardous chemicals

A Safe Job Analysis will identify the need for any other barriers. No one may remove/change barriers without an agreement with the person responsible for the barrier (such as a supervisor). A plastic chain must be used for barriers and be labelled/signposted by the responsible company, contact person (owner), with contact details and date. Barrier tape must not be used.

Colour codes:

- Red/white: Access prohibited
- Yellow/black: Warning of hazardous conditions/area

Order and cleanliness

Good order and cleanliness helps to:

- Prevent accidents and injuries
- Prevent fires
- Ensure good hygiene
- Ensure a pleasant, safe and efficient workplace



You must keep your own workplace clean and tidy.



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Lighting

All internal and external walking zones, including rig areas, must be sufficiently illuminated. This also applies to stairs. Check, maintain and clean lamps and lighting strips regularly. All light connections should be waterproof and protected against wear.

Smoking

AF premises and vehicles must be non-smoking. Premises are defined as offices, meeting rooms, dining rooms, bedrooms and communal/TV rooms etc. Vehicles are defined as AF cars, buses and construction machinery, etc. Smoking is only permitted in designated areas.

Sanctions for violations of HSE rules

Reprimand on site

Anyone who witnesses HSE rules being broken, must reprimand the person concerned.

Verbal warnings

Are used for less serious offences and for first time violations. Verbal warnings are confirmed in writing with a letter.

Written warnings

Are used for serious violations or second time violations, along with a conversation with the project/site manager or HSE manager.

Dismissal

Used in the event of further violations or aggravating circumstances.



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Working at heights

Manual work at heights must be limited as far as possible. When working at heights where there is a risk of falling to a lower level, fall protection equipment must be used. We distinguish between two types of fall protection: fall restraint equipment (guardrails, scaffolding, etc.) and personal fall arrest equipment. Fall restraints must always be used wherever possible.

When working at heights above one metre, the employee must be protected by a railing, safety harness or otherwise. Remember that working at heights in connection with unloading and loading is often done above one metre and must be secured.

All use of unstable 'stepladders' is prohibited in AF. Instead, use a hoist or movable scaffolding, or a well-supported, secured platform ladder with a work platform. Sfs BA's guide 'Good working-environment choices' provides sound guidance on safe alternatives.

Working at heights must be risk assessed!

The risk assessment must also include the rescue procedure and an assessment of necessary protective equipment, harness type, fall arrest system and anchorage points.

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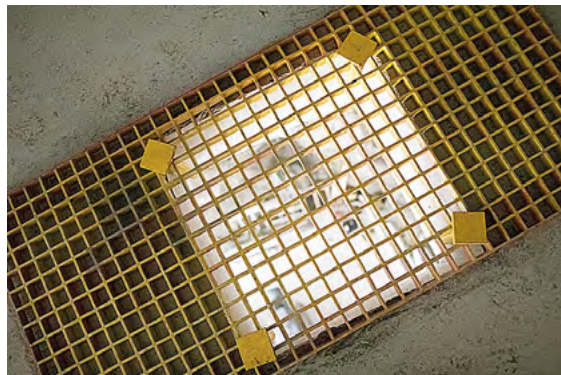
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Securing openings

All openings must be secured with physical barriers. The barriers must be checked and confirmed regularly by a responsible person. If plywood or other boards are used to cover openings, these must withstand the known concentrated load to which the boards can be subjected. In addition, the boards should be secured sideways and clearly marked. Be aware that the boards used to cover openings often do not withstand the weight of hoists or movable scaffolding. The AF boards are recommended for securing and covering openings. If the openings are so big that covering them is not a viable option, the opening must be secured with another physical barrier such as railings.



The AF boards are recommended for securing and covering openings.

Ladders

Ladders may be used for temporary access. If the usage exceeds 20 times per day over two days, alternative means of access such as stair towers must be arranged.

Ladders may under close supervision be used for measuring and laying-out, and for other work that has a duration of less than half an hour, provided that the work only requires one placement. Ladders may not be used when they need to be moved in order to carry out work.



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Ladders must be secured at the top or bottom, or held by another person. The maximum permitted ladder length is 6 m, of which 1 m must protrude above the roof or ledge when the ladder is to be used for temporary access. Inclined ladders must be leant at an angle of between 65° and 75°.



Ladders must be secured at the top or bottom, or held by another person. Inclined ladders must be leant at an angle of between 65° and 75°.

Scaffolding

Before use, all scaffolding must be inspected by qualified personnel and equipped with easily visible approval signs at all access points, with information about the owner, scaffolder, permitted loads, contact person, last date of inspection and inspector. Following reconstruction, inclement weather or other conditions that may have weakened the strength and stability of the scaffolding, and when the scaffolding has been out of use for one week or more, it must always be inspected and approved again (update approval signs). Warning signs must be attached during dismantling and re-building.

The employer must ensure that a report is written regarding inspection of the scaffolding, with information about the inspector and their employer, owner, defects, findings (with deadline for rectification), technical information and the signature of the scaffolding inspector.

The employer must ensure that the party using the scaffolding has received the necessary training in the use of same.

The employer must ensure that personnel working on the assembly, disassembly, modification and inspection of scaffolding receive the necessary training in accordance with the supplier's assembly instructions.



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There are different training requirements for various heights of the uppermost scaffolding floor, respectively, 2–5 m, from 2–9 m and from 9 m.

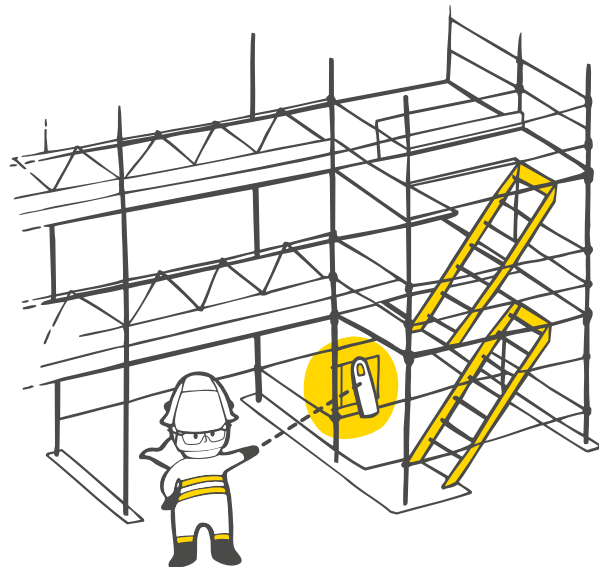
See specification: *Regulations concerning the Performance of Work*, chapter 17 — **Work at height**

It is recommended that a scaffolding supervisor is designated, with responsibility for inspecting the scaffolding.

Scaffolding with work platforms above 1 m should as a minimum have a handrail mounted at a minimum height of 1 m. Handrails must also be installed on the wall if the distance between the wall and the scaffolding is greater than 30 cm. If above 2 m, then there must also be knee rails and foot rails. Nets, tarpaulins or screens must be used if necessary to protect against falling objects.

All work on platforms above 3 m must have an underlying safety platform.

When working on movable scaffolding, all wheels must be locked at all times. Access to movable scaffolding must always be from the inside. Movable scaffolding must only be used on firm, level and horizontal surfaces. No one should be on the scaffolding when it is being moved. When moving movable scaffolding, objects on the scaffolding must be removed or secured from falling off.



Scaffolding must have safe, convenient and appropriate access, preferably with a separate external stair tower. Only personnel who have received appropriate training can assemble, modify and disassemble scaffolding/travelling scaffolding.



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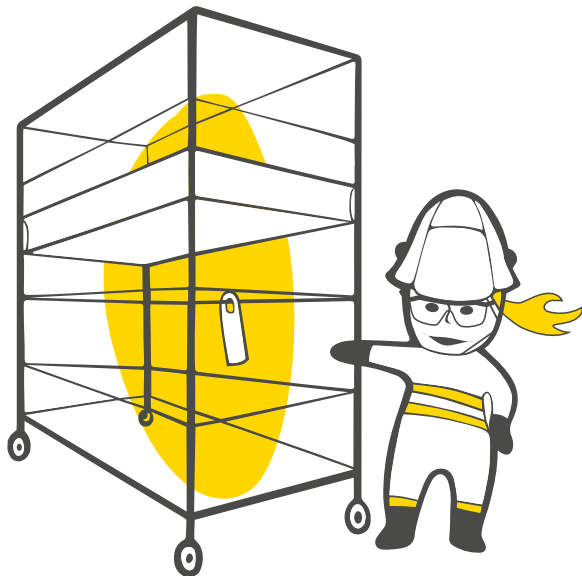
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Instructions for the use of scaffolding

Before the scaffolding is used

The user must ensure:

- That the scaffolding has been inspected and approved for use (approval signs)
- That the scaffolding has been received and a report on the inspection of the scaffolding has been signed by a responsible line manager with the necessary level of expertise
- That the scaffolding has a load class suitable for the work being performed
- That any scaffolding that is not designed to be freestanding is anchored by fastening or securing it to a rigid structure or to the ground.
- That the scaffolding is secured against wind forces that could affect it

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When using scaffolding

The user is responsible for ensuring:

- That foot, knee and handrails have not been removed
- That batten clamps, floor planks, etc. are not removed to the extent that holes appear in the floor of the scaffolding
- That wall mounts are not removed
- That waste, materials and equipment are not stored on the scaffolding

Adaptation and reconstruction of scaffolding:

- Modification, reconstruction and removal of scaffolding parts can only be conducted by qualified scaffolders.
- Permits to adapt scaffolding and remove scaffolding parts must be approved by a qualified scaffolder who has risk assessed the changes.

The user must always notify their manager if faults or deficiencies are discovered in the scaffolding. The work manager must immediately notify the responsible supervisor in AF.

Trenches / slopes

Work in trenches and on slopes has an associated landslide risk. The preparation of a trench plan and work instructions are required for the excavation of a trench or pit deeper than 1.2 m. All unshored trenches deeper than 2 m must have sloping walls with a reasonable incline. Inclined trench edges may also be necessary for depths less than 2 m in unfavourable conditions, for example with heavy rain or when digging below the groundwater level. In frozen soil, excavations may be made with vertical walls when backfilling is done before there is a risk of thawing.

Be especially alert for collapse/landslide on slopes, mountainsides and in trenches when the temperature moves between minus and plus temperatures!

Trenches with vertical sides deeper than 2 m must be shored up with sheet piles or trench boxes, etc. With trenches deeper than 2 m, shoring must be designed by a geotechnician.



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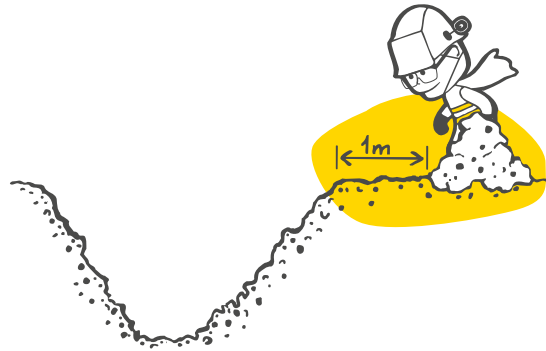
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With intersecting trenches in disturbed ground, the trench walls must have a maximum angle of 45°, even if the trench depth is less than 2 m.



In loose soil shoring may also be necessary at depths less than 2 m.



Excavated material must always be placed at least one metre from the edge in order to avoid an increased risk of collapse.



Trenches deeper than 1 m must always have at least one escape route.

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Plan your work so that most of the excavation, pipe-laying, etc. can take place from the end of the trench. If heavy equipment must be used from the side of the trench, the equipment must be located as far as possible from the edge of the trench.

Remember to place an escape route a good distance from the excavator. There must be no obstacles between you and the nearest escape route.

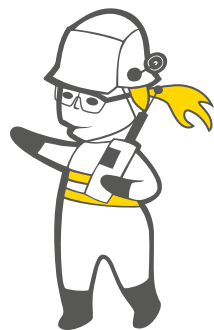
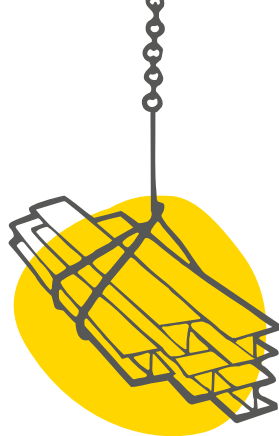
See specification: *Regulations concerning the Performance of Work*, chapter 21 — **Excavation work**

Cranes and lifting gear

All cranes and lifting gear must have undergone inspection by a competent person at least once a year. Certificates should always be kept easily accessible. Approved lifting gear must have a nameplate with certificate number and safe working load.

Colour codes for inspection years for lifting gear may be used:

- | | |
|----------------|----------------|
| ● 2021: Red | ● 2025: Red |
| ● 2022: Yellow | ● 2026: Yellow |
| ● 2023: Green | ● 2027: Green |
| ● 2024: Blue | ● 2028: Blue |



Never pass below a suspended load.



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Straps with white markings are for single use and must be discarded after use.

With all lifting and operations with a risk of falling objects, there must be a safety zone where all traffic is prohibited. The size of the safety zone is defined through Safe Job Analysis.

A Safe Job Analysis is carried out before the crane hoist when several cranes are operating in the same airspace and when it is windy. When several cranes are operating in the same airspace, the crane drivers must have a radio connection. Crane operations must cease during thunderstorms.

Access to tower cranes must not be via a vertical ladder. Ladders must be at an angle or a lift must be used.

Anti-collision systems must be installed when two or more tower cranes have an overlapping work area. This also applies to a combination of tower crane and mobile crane. Sector limiting systems must be fitted on all cranes where high voltage power lines, specific traffic areas, day-care centres or similar are within the crane's work area.

When erecting a tower crane, the mounting and foundation is required to be expertly inspected before use.

Slinging

- In order to undertake slinging you must have completed a documented training/slinging course
- Check the lifting gear visually before use. Damaged or broken equipment must be discarded
- Ensure that lifting tables for the lifting gear in question are available
- When lifting long objects, 2 slings must be used and possibly also a guide rope
- Check the balance of what you have slung once the load is off the ground
- With blind lifts where the crane operator does not have continuous eye contact with the load and the area below, the slinger must fully direct the lift over the radio
- If a radio is being used between the slinger and crane operator, you must state who you are and who you are talking to. Keep messages short and concise. If something is unclear, ask for confirmation

See Chapter 6 **Standard signals and gestures**, for directing cranes.



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Mobile elevated work platforms/aerial work platforms

Cranes and lifting devices must not be used for conveying passengers. Only authorised work cages on cranes/wheel loaders may be used for this.

- It is forbidden to climb onto or down from the aerial work platform when it is in a raised position
- The work cage must be furnished with an anti-crush bar/device
- An automatic anti-crush bar/device is advisable
- Scissor lifts must not be in an elevated position when being moved
- When using an articulated boom lift, employees in the cage must be secured with a safety harness
- Take account of the aerial work platform dimensions before entering a confined or low area
- Never drive over a covered hollow/recess, ramp, floor, bridge, etc., that cannot accommodate the dimensions or weight of the aerial work platform
- Be attentive to blind spots

All operators of aerial work platforms must have received documented safety training for this type of equipment. Equipment-specific training must also have been completed and be documented for the AWP in question. As a minimum, equipment-specific training must include a thorough review of the AWP's safety devices and limitations of use stipulated in the user instructions. The user instructions must be available in a language with which the AWP operator is familiar.



Check that the lift and any supporting legs are standing on a firm, level surface before use.



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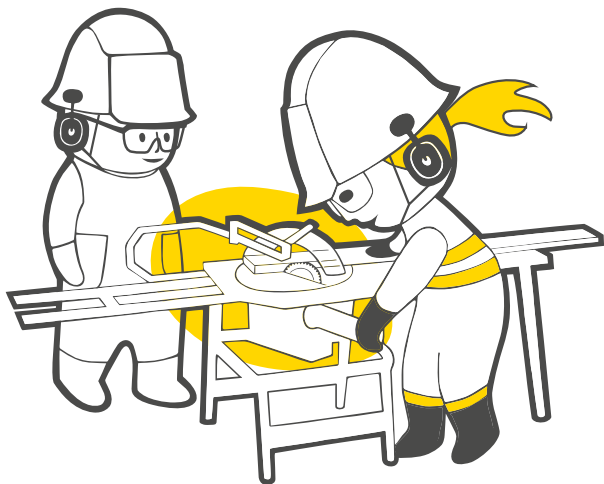
Training in how to use work equipment safely

Machines, tools and other equipment may only be used by individuals who have completed the necessary training in how to operate the work equipment. Anyone who is to use work equipment that requires special care during use shall complete documented safety training. The use of some work equipment requires the user to undergo documented safety training provided by a certified training enterprise. In addition, the employer must ensure that workers are given the necessary training in how to safely use the specific work equipment they will be operating. We call this equipment-specific training.

See specification: *Regulations concerning the Performance of Work*, chapter 10 — **Requirements for the use of work equipment**

- The training must focus on the differences between the individual work devices and/or tools to be used by the employee
- This includes differences in operation, stability, area of use, maintenance routines, etc.
- The training must be based on the user instructions and be adapted to the type of work equipment involved, the user's skill sets and his/her language
- The training must be documented

For disconnecting equipment from machines (buckets, grabbers, steel cutters, arms, booms, etc.), the equipment must always be laid on the ground or secured against tipping over. In order to change such equipment, the operator must ensure that the locking mechanism is engaged and check that hydraulic hoses are undamaged. All hand tools must be checked before use. Defective tools are to be marked as defective and turned in for repair or disposal. It is not permitted to modify tools or use them for purposes beyond the scope specified in the user manual.



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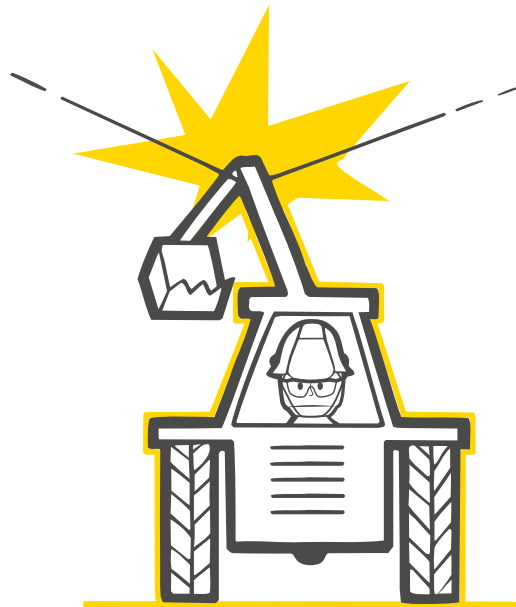
Electrical risk

High-voltage equipment

Flashover of dangerous voltage from high voltage power lines to for example cranes or cables can occur without direct contact with the line. The owner of the high voltage facility (grid owner, Bane NOR, or similar) must therefore be contacted when work will be done closer than 30 m from the installation. The owner will decide what measures are necessary to get permission for such work. High-voltage lines must only be handled by qualified electrical personnel!

Cable detection

Before digging starts in areas where buried cables are expected, network owners will be contacted to show where the cables are (applies to all types of cables, including low current, fibre and signal cables). For low voltage cables the unearthing or undermining of cables must be carried out by hand digging. When excavation is required within a specified safety distance of high voltage cables, the network owner must be contacted. The re-routing or cutting off of existing power cables must be done by qualified electrical personnel!



If a flashover occurs, no one must touch the machine. The operator must remain seated in the driver's seat until the line has been disconnected and the owner of the high voltage installation has given the okay signal for evacuation. Most high voltage installations have automatic re-engagement, i.e. the line will automatically try to restore voltage following a short circuit. Machines must not be touched or moved until qualified personnel with high voltage expertise are present.



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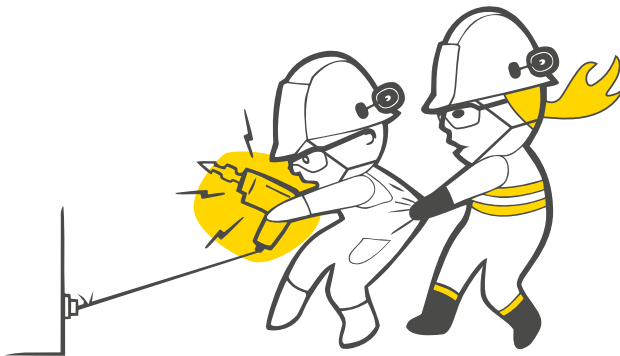
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Electrical equipment

- All electrical components and bare wires are regarded as energised until disconnected and a measurement has been made
- Changes to the electrical equipment including any protective devices is not permitted
- Cables and wires must be placed or protected so that they are not damaged
- Electrical equipment with faults or deficiencies must be immediately de-energised. The fault must be reported to the immediate manager who will ensure that the fault is rectified
- Sweating/moisture can conduct electricity. Use dry gloves when working with electrical equipment
- Use an insulating underlayer (e.g. wood or dry cloth) for work with electrical equipment when lying down
- Make sure the product is CE marked
- Always review the user instructions for the safe operation of the equipment



If someone is caught up in energised equipment, that section of the installation must be de-energised. Turn off the main switch if it is easily accessible or move the energised equipment with a wooden stick or something that does not conduct electricity (NOT in the case of high voltage). Ensure that your hands are dry and that you are not standing on a wet surface.

If you cannot find anything with which to remove the energised object, you must attempt to remove the person (NOT in the case of high voltage). Do not attempt to touch the person's skin, but insulate your hands with dry working gloves or some dry material as you pull the injured person away. Make sure that the injured person or yourself are not subjected to a dangerous fall, as releasing someone often requires considerable force.

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Hot work

Hot work means work where machines and equipment are used that generate sparks and heat that may cause a fire. Hot work includes the use of a naked flame, hot air, welding/cutting and grinding equipment.

The following requirements are set for hot work:

- A certificate of competence for hot work
- Necessary fire extinguishing equipment must be readily available, with a minimum of two 6 kg ABC fire extinguishers. One of the fire extinguishers may be replaced with a fire hose with a minimum diameter of 19 mm and charged with water up to the jet nozzle
- Tight-fitting goggles, gloves and full flame retardant workwear (long sleeves) must be used for grinding, welding and cutting
- Combustible materials must be removed or covered up
- Openings in floors, walls and ceilings must be sealed
- With hot work on painted surfaces, noxious gases and particles are released. Respirators, preferably an air-fed mask, must be used
- Prior to hot work inside a building and in tanks and confined spaces where there is a risk of fire / explosion, a Safe Job Analysis must be carried out

- In tanks and confined spaces it must be ensured that there is sufficient oxygen and that the surrounding atmosphere is not explosive. A gas meter must be used for reliable verification
- It is required to have a fire guard present during the work, and for at least 1 hour after the work has been completed. The fire guard must have the same skill sets as the employee doing the hot work
- Checklists (work instructions) must be used to safeguard and document all safety aspects. As a minimum, these must correspond with the checklist published by Finance Norway



Hot work must only be undertaken by personnel with a certificate of competence.



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Working with gas

- Gloves that protect against heat must be readily available
- Check that hoses, connections and other equipment do not have a leak
- Valves, connections and hoses must be protected from impact and from damage from falling or ejected objects
- Bottles must never be dragged when being moved. A bottle trolley must primarily be used
- First stage devices and other equipment must always be disconnected after use
- Gas must be kept in a suitable place with proper signage. Flammable and/or toxic gas must under no circumstances be kept in a cellar or room/container without ventilation
- Oxygen cylinders must be stored at least 8 metres from bottles with flammable gases when stored in the open air
- It is recommended to use an approved container for storing gas
- Bottles must be stored so that they can not be damaged by vehicles
- All equipment for oxygen must be kept free of grease
- In addition, the rules for hot work and dangerous substances must be followed



Gas cylinders must always stand upright and be secured against overturning with a chain or similar.

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Rock blasting

Electric detonators must not be used when blasting. Electronic detonators are permitted. Explosives and detonating devices must only be handled by people with the necessary expertise.

Standard warning instructions for blasting operations:

- Short bursts of the siren of 1 min duration before blasting
- Blasting
- One long blast of the siren — all clear

In the event of suspected undetonated explosives, a Safe Job Analysis must be carried out before any further work.

Rock scaling

The scaling and securing of rock faces is a necessary measure to avoid rock falls. This work must be performed by experienced personnel because it is particularly risky and requires special knowledge of rock faces.

Be especially alert for rockfalls when there is heavy rain and when there is a change from minus to plus temperatures!



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Health



Work related disease and illness often occurs following prolonged harmful exposure. It may therefore be difficult to see the relationship between the exposure and the disease/illness. For this reason it is important that both the employer and employees are informed about how different exposures can affect our health.

Employers are legally required to risk-assess all exposures, and to take steps to ensure that health is not adversely affected. Employees must cooperate with the employer on this. If other measures do not reduce exposure to an acceptable level, the necessary protective equipment must be used.

The health chapter introduces the most common health exposures, within the physical and psychosocial work environments. For more in-depth information it is recommended to study the AF health card.

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Physical work environment

Noise

Volume is measured in decibels (dB). An increase of 3 dB corresponds to a doubling of the volume. A volume over 80 dB entails a risk of hearing damage and measures should therefore be implemented. Hearing protection must be used if other measures do not have sufficient effect.

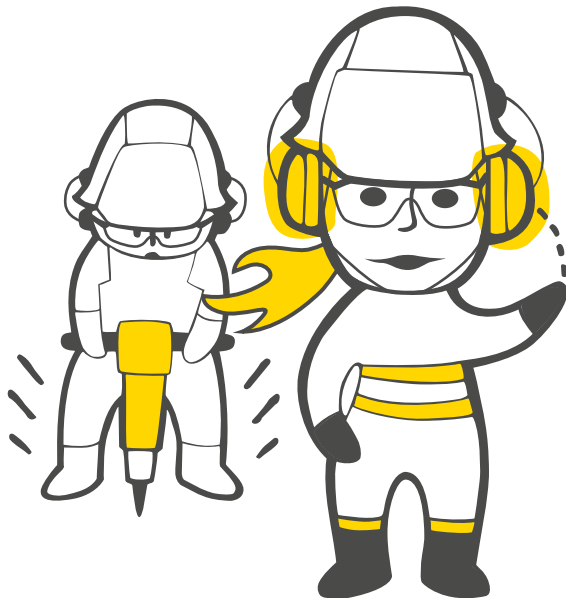
If you occupy or work in areas with 95 dB or more, double hearing protection must be used (earmuffs + ear plugs). No one is permitted to work in areas with noise levels that exceed 110 dB. With noise levels over 105 dB, very brief exposure can damage your hearing without hearing protection.

Use of hearing protection in combination with protective glasses, old and poorly maintained hearing protection and wrongly inserted ear plugs can reduce the effectiveness of hearing protection.

Preventive measures in order of priority:

- Consider alternative work procedures that give a reduced exposure to noise
- Increase the distance to the noise source
 - a doubling of distance reduces noise levels by 6 dB
- Enclose the noise source
- Mark noise zones

- Use proper hearing protection (category 1, 2 or 3)
 - is there a need for dual hearing protection?
- Warn colleagues of noisy work



Increasing the distance to the noise source is an effective way of reducing the noise impact. Use hearing protection where other protective measures are not possible.



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Dust

Dust can affect mucous membranes in the respiratory tract and cause acute disorders such as bronchitis and pneumonia. Over time, the prolonged inhalation of dust can lead to chronic lung disease.

In the event of high dust concentration in the air, measures must be taken to prevent or reduce the inhalation of dust. Possible measures may include regular watering or using dust-binding agents. Indoor sweeping with broom must not take place, here a vacuum cleaner must preferably be used. Use of mops is acceptable for primary cleaning. Use equipment that has built in dust extraction.

Acceptable limit values for the amount of dust in the air vary depending on the type of dust.

If it is not possible to reduce the concentration of dust in the air to acceptable levels, protective equipment must be used. Power-assisted respiratory protective equipment (RPE) or a self-contained breathing apparatus (SCBA) is advisable for exposure to high concentrations. Filter masks must have a P3 label. P3-filters protect against hazardous fine dust and smoke, biochemical substances, micro-organisms, spores, viruses, bacteria and quartz. Dust masks do not protect against gases or vapours.

See also Chapter 1 about **respirators**.



Prolonged inhalation of dust may lead to chronic lung diseases. Protect your lungs with a suitable mask when other measures do not provide sufficient effect.



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Asbestos

Asbestos fibres in the air may occur due to re-modelling or demolition of older buildings mainly in the following locations:

- Roofing and wall panels (Eternit etc.)
- Insulation of hot water pipes
- Fire breaks (walls, ceilings, between heaters and wall)
- Brake linings in older lifts
- Vinyl coatings
- Fire insulation on steel beams
- Ventilation ducts



In the event of suspected asbestos, work must be stopped and the supervisor/foreman must be notified. Asbestos must only be handled by workers with special training in this.

Hot work

When welding, cutting, burning, soldering, grinding, sanding and finishing, materials are heated which makes them change character and noxious by-products are released in the form of dust and gases. The substances can affect health in the short or long term with sometimes serious and chronic illness. Survey and take material samples if there are unknown components in the material to be heated.

- Use alternative work methods, for example cold cutting, if possible
- Use an extractor where it exists, or consider installing extractors
- Use masks with appropriate filters or use respirators
- Change the filter regularly and ensure good maintenance of masks
- When burning on painted surfaces, an air-fed mask or motor assisted filter mask must be used



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Gases

Some gases have an acute effect on health, while others can cause illness in the long term. Poisonous gases may cause harm even at low concentrations. Some gases are flammable and some are odourless. Gas meters are used to investigate the occurrence of gases.



Typical work environments and work assignments where you may be exposed to gases are:

- Tunnel work
- Blasting work
- Work with chemicals
- Work in tanks and enclosed spaces
- Hot work
- Work close to emissions from combustion engines
- Work in areas where biological material is decomposing (typically in construction pits and trenches on previously built land)

One should always try to reduce gas exposure associated with work processes. In addition, the surveying and measuring of gas levels may show that it is necessary to use protective masks:

- A mask with gas filter (make sure it is fitted with the correct filter for the type of gas involved)
- Air-fed mask

It is important to regularly check and maintain masks.

See also Chapter 1 about **respirators**.



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Sewage

Workers who are in contact with waste water have a certain risk of being infected by bacteria and viruses. The risk depends on the degree of contact with sewage, and the risk of infection is reduced by the proper use of protective equipment, good personal hygiene and preventive practices during the working day. Preventive measures alone may not be sufficient to reduce the risk to an acceptable level. Therefore it must be considered whether employees who are exposed to waste water must be offered vaccinations against sources of infection.

Chemicals

Some chemical products are very harmful. Employers must therefore create a substance index of safety data sheets that must stay with the products when they are in use. Pay particular attention to points 1, 2, 3, 4 and 8 on the safety data sheet. Before using substances that are labelled toxic, harmful, highly flammable or harmful to the environment, a risk assessment must be completed based on the safety data sheets. There must be an assessment of whether less hazardous substances can be used instead (substitution assessment).

All chemicals are potentially harmful, it is the inherent characteristics of the chemicals, combined with the quantity and length of exposure, that will determine how hazardous a work process may be.



Chemicals will generally kept in their original packaging. If chemicals must be transferred to another receptacle it must be labelled in the same way as the original packaging.



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Cement and concrete

Cement is a corrosive product that can cause extreme irritation to the skin and mucous membranes. In serious cases, cement can cause deep corrosive injuries. The eyes are particularly vulnerable. Cement can also be a constituent part of mortar, concrete and tile adhesive, for example.

Concrete is cement powder mixed with water, sand and stone. Concrete can be an irritant can in worst-case scenarios cause corrosive injuries to the mucous membranes, skin and eyes.

Cement-based powder products are often only marked as an irritant as they are not corrosive before coming into contact with moisture (such as water, tear fluid and moist mucous membranes).

Wet cement is alkaline with a pH of 10–14. In the early stage, a corrosive injury will often be symptom-free, meaning that preventive measures are often taken too late. Thus, second and third degree corrosive injuries are not an unusual consequence.

Eye contact with cement (dry or wet) can result in serious and potentially irreversible injuries.

Irritated eczema from wet cement can result in an allergy to soluble hexavalent chrome.

Preventive measures

- Plan the work in such a way that there is the least possible soiling of work clothes and skin
- Clothing that has been soiled by fresh concrete or mortar must be immediately removed. Wash soiled skin in soap and copious amounts of clean water
- Protect the hands with impervious, hard-wearing and alkali resistant gloves.
- Special precautionary measures should be taken to ensure that wet cement does not penetrate into boots/shoes
- In certain circumstances, for example, when laying concrete or screed, it is necessary to use waterproof trousers or knee protectors



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Vibrations

Hand and arm vibrations occur when using vibrating hand-held tools. Use of such a tool entails a risk of damage to blood vessels, nerves, muscles and joints. Symptoms of health problems can be paroxysmal white and numb fingers, pain and loss of strength in the hands.

You must know how much the tool vibrates, because the vibration level is crucial for how long you can use the tool per day. All tools must be marked with the maximum usage time. When using several vibrating tools per day, it is the sum of vibration for those tools that restricts their use. If you cannot find information on vibration levels, it can be measured. The AF occupational health service has equipment to do this.

At AF it is mainly machine operators who are exposed to whole-body vibration. Health issues can include back, neck and shoulder disorders. An even surface, good driving seat/cabin and a focus on speed and driving style are the most important barriers for reducing whole body vibrations.

Ergonomics

Musculoskeletal disorders are the most frequently occurring disorders, and the most costly disorders for society, AF and the individual.

Many suffer musculoskeletal disorders that are wholly or partly due to work tasks. Pain may come suddenly in the form of, for example, inflammation, or wear through prolonged strenuous work. Usually disorders are experienced in the lower back, neck, shoulders, hips and knees.

Focusing on ergonomics is important in preventing musculoskeletal disorders. Ergonomics can be described simply as adapting a work environment/technique to suit the individual, and both the employer and employee must pay attention to what is good ergonomics. Movement and proper loading is both healthy and necessary. The aim is to reduce unnecessary strain and overloading. Tasks which over time produce heavy, repetitive work, unilateral/stressful working postures, and considerable time pressure are particularly unhealthy.



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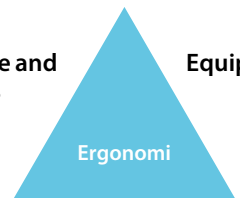
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Knowledge and awareness



Equipment and tools

Organisation of work

Good ergonomics is achieved when all sides of the “ergonomics triangle” are in place:

Knowledge and awareness: Which movements do our bodies best tolerate? Which working postures are good? Is the best work technique being used? Do you have good habits?

Equipment and tools: Is the best and most appropriate tool for the task being used? Is good maintenance being ensured? Are good means of assistance available?

Organisation of work: Are tasks undertaken in a favourable order with variation in mind? Is job rotation implemented? Are materials placed where they are needed? Do you remember to take short breaks? Do you ask for help, for example with heavy lifting?

It is not difficult to give the “right” answers to these questions. The challenge is to have a system which ensures we do the right thing, even on a busy day.

Ergonomic exposure may include:

- Work squatting or kneeling
- Work with hands held above shoulder height
- Monotonous work
- Heavy lifting and carrying
- Leaning forwards without support from hands/arms
- Standing or walking work
- Monotonous arm or hand movements
- Physically strenuous work
- Work with neck bent forwards or backwards



To avoid disorders you need to use your body correctly.



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For more information about the different ergonomic exposures, see the AF health card for the project you are working on.

Psychosocial working environment

For most of us, work revolves around providing services to earn wages and benefits. But often work means so much more. The workplace can also be an arena where someone uses their qualifications in such a way that they feel useful. It is satisfying to feel mastery, and experience professional and personal development.

Working life differs from most other arenas in that the degree of self-determination is reduced. There is someone else who decides what you will do and who you will work with. The Working Environment Act provides clear guidelines for interaction and communication in the workplace. Everyone is entitled to a work environment where people respect each other. No one must be subjected to harassment or other improper conduct, no one should violate the integrity and dignity of others, and employees must not be exposed to adverse psychological strain. The workplace must be an arena where people feel safe and get on well with their colleagues.

Both the employer, the employees themselves and colleagues of those who encounter problems in the workplace are obliged report this and seek to resolve the challenges. Collaboration problems, conflicts, harassment and stress must be dealt with. The reporting and management of work environment problems must happen as early as possible.

Working environment problems must initially be brought up with the immediate manager. You can also seek advice and guidance from the safety service, employee representatives or from Human Resources. The Occupational Health Service has a neutral role in work environment issues and can be contacted for assistance in such cases.



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External environment



We must pay attention to our surroundings when we are at work. All burdens on the environment must be minimised and unnecessary damage must be avoided.

Everyone has a responsibility to protect and maintain the environment.



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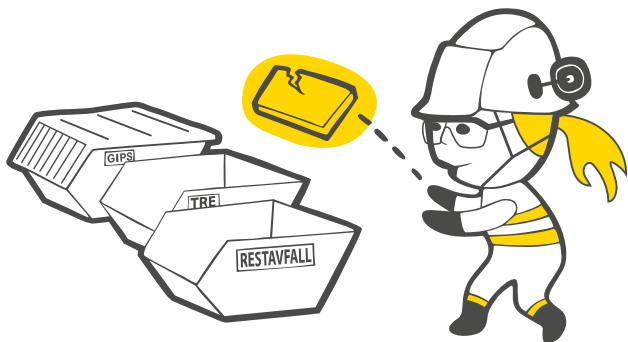
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Waste management

Good waste management is planning in order to minimise the amount of waste produced and implementing good recycling routines for the waste that is generated.

Hazardous waste must not be mixed with other waste, but disposed of in special containers.



All waste must be sorted and placed in labelled containers. The purpose of sorting is to facilitate recycling. Some waste components, such as plaster, must be stored dry. The purpose of sorting at source is to make recycling and reuse possible. Sorting is important for environmental reasons, but also because it is economically advantageous and because we get better organised, safer and more efficient workplaces.

Discharges and emissions

Unintentional emissions to air, water and soil must be prevented.

- Refilling of fuel must take place in locations that are established for this or from tankers or mobile tanks with an approved quick release coupling
- Tanks and containers must be located so that they are not vulnerable to collision or other damage that may lead to spills. These units should be placed on a non-permeable substrate or in a secondary container.
- Repairs and maintenance work on machines must be carried out in working areas with an impermeable sheet and oil separator
- Washing must take place in an approved wash bay
- Run-off/erosion into watercourses must be restricted



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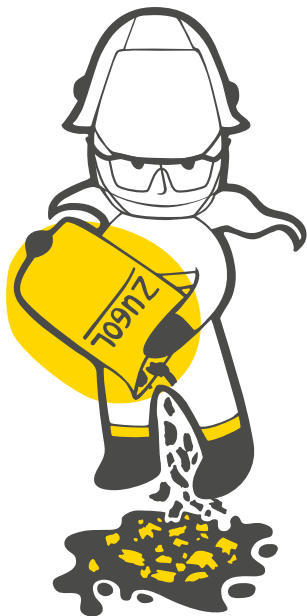
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All construction sites and all machines must have an absorption agent (Zugol, etc.) in case of an undesired incident involving oil/fuel.

Energy consumption and greenhouse gas emissions

Greenhouse gas emissions at our construction sites come from multiple sources: energy use, emissions from the production of materials, transport of aggregate, materials and waste, etc. This makes it crucial to prioritise solutions that restrict and minimise the use of energy (primarily fuel) and electricity and minimise volumes of waste.

Examples of solutions:

- Up-to-date, fossil-free/emission-free machinery
- Smart, energy-efficient lighting
- Energy-efficient heating and drying of the construction site
- Logistics/driving technology
- Avoid idling
- Energy-efficient worker sheds
- Insulated containers

Noise

Noise complaints arising from our operations will be limited by the use of modern methods and machinery, and by planning work so that noisy activities will, as far as possible, be carried out during the daytime.



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Dust

Described in chapter 3.

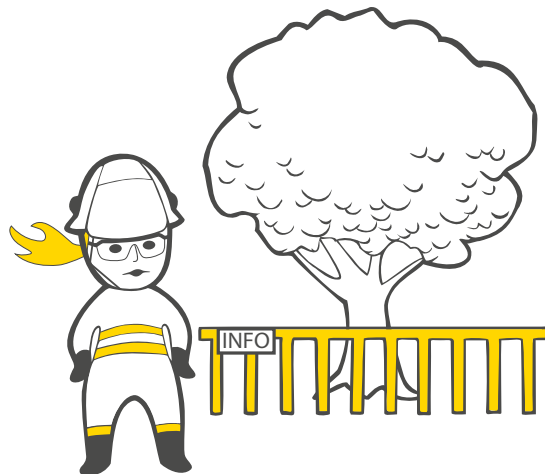
Water consumption

There is good access to water in Norway and Sweden, but many resources are used to make it available from the tap. Therefore, it is important to reduce water consumption in our production processes and prevent leaks at the same time. Water consumption should be followed up and visible water leaks should be checked for during safety rounds.

Material and product selection

For these products, we must assess alternatives and replace them with less hazardous products if this is possible without unreasonable cost or inconvenience (substitution assessment).

We need to make sure that the timber/wood we use in our projects comes from trees that have been legally felled and marketed. A good way to do this is to choose certified wood products. Examples of reliable certification schemes are FSC and PEFC.



Artefacts and red-listed species

In the event of the suspected discovery of artefacts or red-listed plants, organisms or animals, work must be stopped immediately and the customer/authority notified.

Light pollution

We need to make sure we limit light pollution. Light pollution occurs when we cast illumination towards the sky. See also chapter 1 on **lighting**.



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Preparedness and first aid

In the event of an accident involving personal injury

- Protect the injured, limit the consequences. Ensure your own safety.
- Call for help from colleagues.
Call **1-1-3** for an ambulance
- Start first aid
- Notify the management
- Secure the accident site, keep people away
- Direct those not involved at the scene of the accident to the agreed meeting point

In the event of fire or explosion

- Call for help from colleagues.
Call **1-1-0** for the fire brigade
- Start extinguishing if possible
 - In the event of fire in power sources, water or powder must NOT be used before the power has been disconnected
 - In the event of a risk of explosion: Evacuate the area immediately
- Assess the spreading risk. Try to limit the fire
- Evacuate the area if necessary
- Notify management

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Familiarise yourself with the location of first aid and emergency response equipment at the project site.

In the event of a pollutant discharge

- Limit the spread of the pollution. Look for the source, it may be hidden
- Apply Zugol or similar. Avoid using water!
- Notify management
- Dig up polluted soil and place it in a container for hazardous waste
- Notify the fire brigade on **1-1-0** in the event of a major pollutant discharge or complex situation

If an incident occurs:
Call AF's emergency phone number

+47 22 89 12 00

First aid



How to prioritise?

Think ABC when providing first aid:

A Airways

B Breathing

C Circulation

Use this rule when you have one or more injured parties.

First you must secure everyone's airway (A), then you must ensure that everyone is breathing (B), before taking any measures regarding circulatory failure (C).



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Examine the injured person

- Talk to them
- Look at them
- Touch them



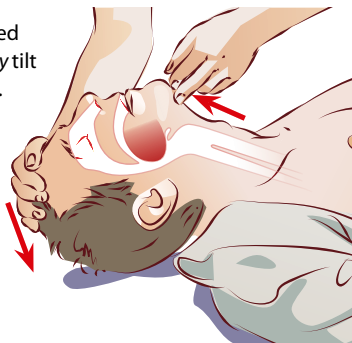
A Airways:

Is the person's airway open and clear?

- If the head and chin is positioned down towards the chest, the weight can obstruct the airway and the person may suffocate.



- The chin must be up and the head must be tilted backwards!
– In cases of suspected neck injuries *carefully* tilt the head backwards.



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B Breathing:

Is the person breathing?

- Listen, feel and look for breathing for 10 seconds
 - People who are not breathing:
Start cardiopulmonary resuscitation (CPR)
 - People who are breathing:
Look for signs of circulatory failure



C Circulation:

Does the person have symptoms of circulatory failure?

- Pale, cold and clammy skin
- Freezing/trembling
- Behaving strangely (“out of it”)
- Can you see blood or signs of internal bleeding?
- Is the person complaining of any pain?
- Is the person asking for something to drink?

Measures against circulatory failure

- Keep the person warm
- Lay a conscious person flat with legs raised
 - A conscious person with chest injuries and breathing difficulties should sit half upright in order to make it easier to breathe
- Stop any bleeding
- Do not give them anything to drink
- Provide psychological support



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**If unconscious and not breathing
– Start resuscitation**

Remember to call 1-1-3 if it has not already been done!

Start with 30 chest compressions:

- Place the person on their back on solid ground
- Press in the centre of the chest. Press straight down with straight arms (5-6 cm for an adult)
- Release and press down again
- Use approx 30 chest compressions in 18 seconds (equivalent to a rate of 100 compressions per minute)



Continue with 2 breaths:

- Open the airway by lifting the chin up and forward, at the same time carefully tilt the head backwards. Look for foreign objects in the mouth and if so remove them
- Squeeze the nostrils together and press your mouth over the person's mouth
- Blow carefully in until you see the chest rise. Use approx 1 second for each rescue breath.



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- Let the air come out again
- Blow in again
- Continue alternating between 30 chest compressions and 2 rescue breaths until help arrives

If unconscious and breathing

- To keep the airways clear place the person on their side
- Move the top leg up and forwards to stabilise the person



- Tilt the head back and position the face with the mouth low, supporting the chin with the person's hand.

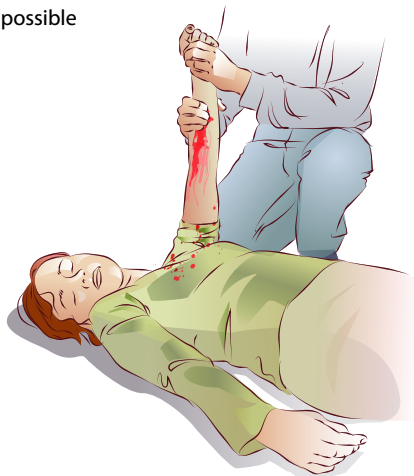


- Remove blood and vomit from the mouth
- Regularly check that the person is still breathing
- Keep the person warm: Outdoors put the person on a blanket. Also cover the person with clothing or a blanket if you have one

Note: With suspected neck or spinal injuries evaluate whether to place the person on their side or not.

External bleeding

- Press directly on the location of the wound.
- Hold the location of the wound as high as possible



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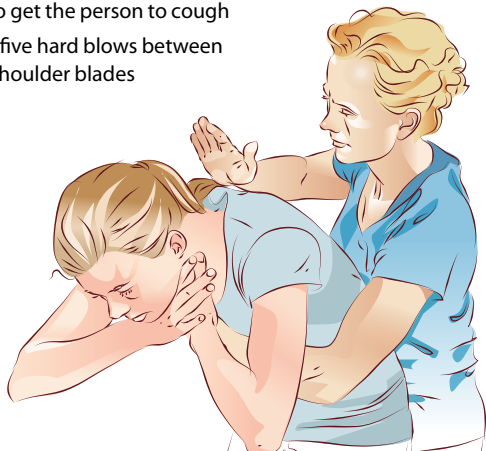


Foreign bodies in the airways

Foreign bodies in the airways can block the airways and could cause the person to suffocate.

What you can do:

- 1 Try to get the person to cough
- 2 Give five hard blows between the shoulder blades



- 3 Give five quick abdominal thrusts (Heimlich manoeuvre)
- 4 Continue alternating five back blows and five abdominal thrusts until the foreign body is ejected
- 5 If the person loses consciousness: Start with CPR



Heimlich manoeuvre

- Stand behind the person
- Place a fist between the navel and the breastbone
- Place your other hand on top of the first
- Move your hands quickly inwards and upwards
 - Release and repeat
- Assess how hard to do it based on the person's size

Burns

- Cool quickly with cold water for the first few minutes
- Cover damaged skin with sterile gauze or clean cloth
- After that cool it down with lukewarm water (approx 20 degrees) for at least 20 minutes
- Do not tear away fabric if it is stuck to the skin
- Apply a burn dressing (WaterGel or similar)

Call 1-1-3 to arrange transportation and place of treatment.

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Electrocution

Consider your own safety so that you are not exposed to electrical current.

Respond to symptoms of electrocution as with other first aid (burns, unconsciousness, respiratory arrest, fall injuries, etc.).

People who have been exposed to the following must go to the hospital/emergency room for follow-up:

- High-voltage current
- Lightning
- Low voltage electric shock with probable current flow through the body
- Unconsciousness or dizziness following electrocution
- Burns
- Signs of nerve damage (e.g. paralysis)

Mental first aid

- Spend time with the person who is injured
- Show concern for anxious people
- Explain what has happened and that help is on the way
- Be a good listener and acknowledge the injured person's concerns
- Keep bystanders away

Do not give up! All first aid efforts must continue until healthcare professionals take over.

Debrief

Talk with others about what you have experienced

- Talk about your own reactions in retrospect — it will do you good
- Describe the incident:
 - What did you see?
 - What did you hear?
 - What were you thinking?
 - What did you do?



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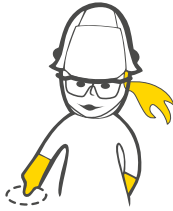
Signals and hazard symbols

← Standard signals and signs for directing crane movements →



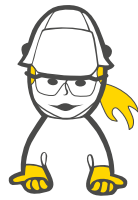
LIFT THE LOAD

With the arm raised, index finger pointing up, move the hand in small horizontal circles.



LOWER THE LOAD

With the arm lowered, forefinger pointing down, move the hand in small horizontal circles.



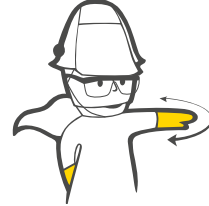
TELESCOPIC BOOM OUT

Both fists in front of body with thumbs pointing outwards.



TELESCOPIC BOOM IN

Both fists in front of body with thumbs pointing inwards.



STOP

Arm straight out, palm down, move your arm quickly to right and left.



LIFT THE BOOM

Arm straight out, hand closed, thumb pointing straight up.



LOWER THE BOOM

Arm straight out, hand closed, thumb pointing straight down



TURN

With the arm straight out, point with the fingertips to the side you want the boom to turn.



SIGNAL NOT ACKNOWLEDGED

One hand moves forwards and backwards. The palm towards the person being signalled to.



QUICK STOP

Arms straight out to the side, palms down, hand moves quickly to the right and left.

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ACUTELY TOXIC



CHRONIC HEALTH HAZARD



HEALTH HAZARD



FLAMMABLE



GAS UNDER PRESSURE



CORROSIVE



EXPLOSIVE



OXIDISING



ENVIRONMENTAL HAZARD

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AF's emergency phone number

+47 22 89 12 00

AF Gruppen ASA
Phone +47 22 89 11 00

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