



# Advice and safety instructions

*for Trafikverket  
track areas*



# Working Environment Act

## Extracts from the Work Environment Act

### Chapter 3, Section 2

"The employer shall take all precautions necessary to prevent the employee from being exposed to illness or accidents." this is the official translation on the Swedish government website.

### Chapter 3, Section 4

"The employee shall participate in work relating to the work environment and shall take part in the implementation of the measures needed in order to achieve a sound work environment. He shall comply with directions issued and use the safety equipment and exercise such other precautions as are needed for the prevention of illness and accidents."



# Fundamental railway technology

Trains run on tracks consisting of rails and sleepers. The tracks rest on a bed of macadam or gravel. Rail traffic is controlled by signals that may be actuated both automatically and manually.

Current flows from a converter station, through the overhead conductor and the current collector (pantograph) of the locomotive. The current then flows from the locomotive back to the converter station through the wheels, rails, and return conductor. So the rails are part of the electrical conductor system.

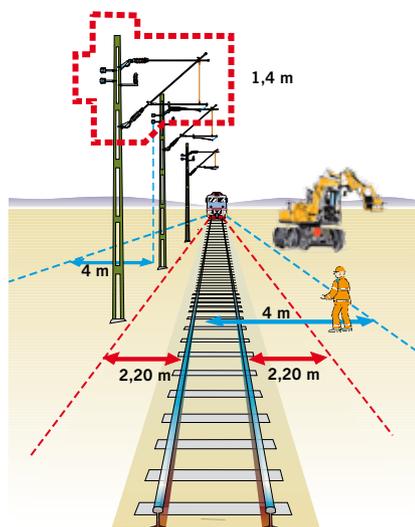
Therefore, extensive cable network for communication and monitoring is provided along the railway lines. The railway network is largely electrified.

A train can run at high speed and silently. At **200 km/h**, it needs a braking distance of **2500 metres**.



## What are the rules in the track area?

The track area is the area adjacent to and on the track system. The extent of the track area is decided by Trafikverket locally from case to case.



Within the track area, you must wear high-visibility clothing or a high-visibility vest in accordance with Standard EN471, class 2. In certain cases, you may also have to wear safety shoes and a helmet.

For every activity carried out in the track area, the work management shall carry out planning and appoint a protection and safety leader – a P&S leader. The P&S leader verifies that the work can be done securely and safely.



## What are the rules in the safety zone?

The safety zone is the area that must be free from obstacles for traffic on the track. The safety zone extends at least 2.2 metres out from each rail, although Trafikverket may make local decisions to enlarge the zone.

If you are working with flammable goods on a track used by traffic, you may use only the quantity necessary for the activity. Containers with more than 20 litres of flammable liquid, gas containers or explosive goods are not permitted within the safety zone.

In the following cases, the work shall be carried out when the track is closed to traffic:

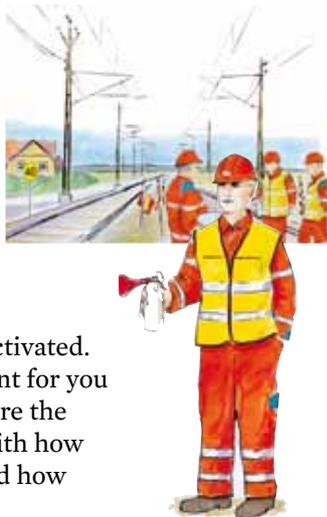
- when machines are entirely or partially within the safety zone
- when machines are to cross the track outside a level crossing.

You may use light appliances weighing up to 120 kg on a track that is open to traffic, provided that the appliances can be moved or tilted off of the track whenever necessary.

## Safety zone

### Activity on a track that is open to traffic

The P&S leader is responsible for ensuring that a train warning system is available at the workplace, if necessary. Either manual or automatic train warning may be used. You must immediately leave the safety zone when the train warning system has been activated. It is therefore very important for you to become acquainted, before the beginning of the activity, with how a warning will be issued and how the area should be cleared.



***The workplace must be cleared at least 10 seconds before the train passes the workplace.***

### Activity on a track that is closed to traffic

A supervisor is responsible for the safety measures for activities on a track that is closed to traffic. Appliances that run on the rails shall be inspected.

### Crossing a level crossing

Before a vehicle that is heavy, slow, or long crosses the track at a level crossing, the P&S leader must assess whether the vehicle can cross the track safely.

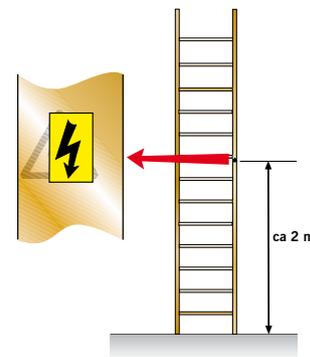
## Working close to live equipment

Take great care when working close to live equipment, since high voltage may cause flashover without you being in direct contact with the equipment.

The area within 1.4 metres from live equipment at normal voltage – i.e. 15 000 volts – is known as close-up area. At voltages other than the normal value, the boundary of the close-up area will be different.

When working so close that you are likely to come within the close-up area with some part of your body or some object, an electrical work supervisor must be available to tell you what safety measures are necessary for the work.

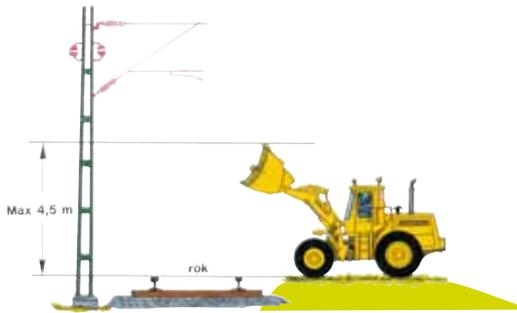
Handling long objects is dangerous. If you are using a portable ladder that is longer than 2 metres, the ladder should be made of insulating material and shall be marked with a black lightning arrow. This also applies to accessories and tools.



Working platforms, skylifts and the like may be used on an electrified track only if your electrical work supervisor has received local clearance from Trafikverket.

# Use of machines

When a crane, digger or loader is used for work within 4.0 metres from the nearest live part, an electrical work supervisor must take part in the work. The electrical work supervisor will tell you what electrical safety measures must be taken for the work.



## Machines that do not run on the track

A machine that does not run on the track may be used close to a live conductor provided that

- the machine is either provided with a height limiter that has been inspected and approved by the electrical work supervisor

or



- the work is carried out under the supervision of the electrical work supervisor.
- the machine or its load does not come closer to the conductor than **1 metre**.
- the electrical work supervisor has provided the machines with protective earthing.

## Machines that run on the track

A machine that runs on the track may be used close to a live conductor provided that

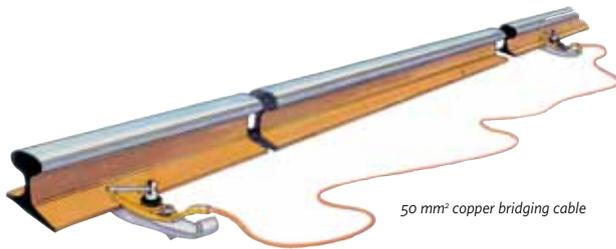
- the machine or its load does not come closer to the conductor than **0.4 metres**.
- the entire structure of the machine is reliably grounded.
- the machine is restricted to **a maximum of 4.7 metres** above the top edge of the rails.

A machine that runs on the track and is **not** reliably grounded throughout its entire structure may be used if the machine or its load does not come closer to the conductor than 0.6 metres and is restricted in height to a maximum of 4.5 metres.



## Working on the track

If the rail of an electrified track is to be changed, the electrical work supervisor shall bridge the continuous rail at the point where work is to be carried out, using a 50 mm<sup>2</sup> copper cable. The return current circuit will then remain unbroken across the workplace.



In order to prevent dangerous voltage differences in the event of faults in the setup, electrically conductive parts such as overhead line posts and bridge railings are connected to the rail by means of a copper cable or a copper wire. If this conductor is broken while you are working or if you notice a broken conductor, you must report this to the nearest work supervisor.

## Risks

To avoid exposing yourself to unnecessary risks while working, there are certain extremely important things to bear in mind:

- Never walk or run in front of a vehicle that is moving towards you.
- Vehicles running on the track may roll virtually silently. Background noise may also mask the sound of a vehicle approaching you.
- Never stand between a platform or loading platform and stationary wagons, since these may start to move. Never crawl under wagons, even if they are stationary.
- Don't ride on railway vehicles.
- Don't walk in or touch points or brakes. You may be crushed if they should suddenly begin to move.
- Don't stay in tunnels and on bridges, since you may be struck by a passing vehicle.



# Prohibited

Under a live contact line, the following actions are **prohibited**:

- climbing up a contact line post.
- climbing up on the bonnet or roof of a vehicle or on the load on an open wagon.
- loading or unloading.
- spraying water.
- A space used for warehouse, storage or similar purposes must not extend into the safety zone. A warehouse or other objects placed next to the railway must not come within **4 metres** of a live section of the facilities or equipment.

**No** gas cylinders, explosive goods or more than 20 litres of flammable liquid are permitted within the safety zone.

# Accidents

In an emergency situation:

## Dial 112

If an accident or an incident that may lead to an accident should occur, contact the work supervisor or other person in charge at Trafikverket. They will raise the alarm in accordance with the routines applicable to accidents.



# Questions and answers

Questions	Answers
How fast can a train travel?	A train running at 200 km/h will travel 56 metres in one second.
What is the stopping distance of a train travelling at 200 km/h?	2500 metres
What is a track area?	The area adjacent to and on the track.
What is a safety zone?	The area that must be clear of obstacles to traffic running on the track. The safety zone is normally 2.2 metres from the nearest rail.

Fragen	Antworten
What is the voltage of the Trafikverket contact conductor?	15000 volt
What is the close-up area?	An area around live parts, normally 1.4 metres.
How close to a high-voltage line may I work with my machine without electricity safety measures having been carried out?	4 metres
At what distance from an electrified track may a stockpile be located?	5 metres from the nearest live part.



# For more information

For further information on safety at work in the track area, contact Trafikverket on phone number: +46-(0)771-921 921.



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