

## **M2-EN.2 ORGANISATION OF THE CONSTRUCTION SITE**

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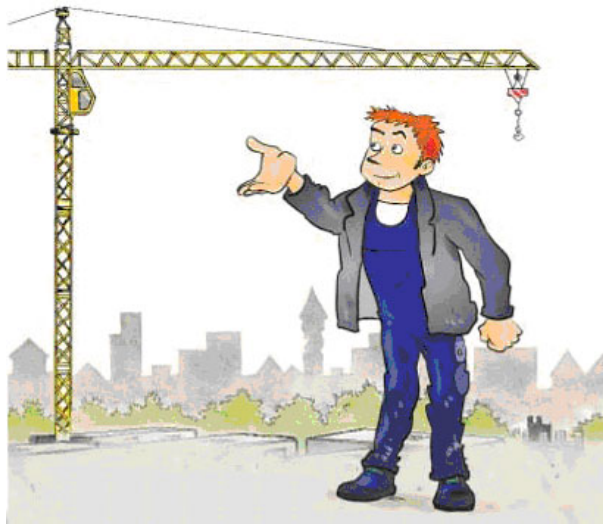
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### **M2-EN.2.1 Introduction**

In this chapter, the general regulations for the organization of construction sites are described. The objective of this chapter is to:

- Identify the most common risk factors
- Describe the constitution of the risk
- Make proposals on how to reduce these risk factors

An essential factor in relation to safety at the construction site is the organization of the site, including the establishment of access roads, escape routes and welfare measures such as toilets, bathrooms and canteens.

A well-organized construction site is fenced in so that unauthorized persons are not exposed to danger from the traffic on the site. The site is organized and kept clear in order to obstruct neither the driving nor the walking traffic. The driving and the walking traffic are if possible kept apart. It must be easy to keep pathways free of water, mud and ice, and they must be organized in a way that makes traffic with e.g. sack trucks possible.

Shacks and welfare measures must be established in conformity with the regulations, and they must be placed practically in relation to the workplace and the access from public roads.

### **M2-EN.2.2 Digging**

Digging must be planned. When planning the character of the ground must be taken in consideration. This includes the nature of the ground, eventual pollution and height of the groundwater, wires, and conduits for electricity, gas and communication, transport conditions and anything else, which might have an impact on safety. (M2.2.1.jpg)

#### **Risk Factors**

- Risk of collapse
- Falling of people into the excavation
- Falling of objects into excavation
- Means of access
- Contact with underground electrical conduits
- The risk of collapse is intensified by rain, snow and frost
- Landslide danger in the excavation
- A steep slope always has a risk of landslip

#### **Safety Measures**

- Make a survey on the nature of the soil before starting
- Provide enough slope if possible
- Proper support of the sides of the excavation
- Fencing (M2.2.2.jpg)
- Disconnect electrical supply-Remove any electrical conduits
- Remove excavation soil or any other material from the boundary of the excavation
- Consider traffic and take measures to avoid vehicles to pass near the excavation
- In an excavation without stiffening, the sides must have a rest in order to avoid landslides
- In case of insufficient rest on a steep slope, stiffening must be made in conformity with the regulations
- Make sure that ladders are at hand in the excavation and that the necessary escape routes are established

### **M2-EN.2.3 Laser**

Direct laser radiation as well as reflected radiation may be dangerous. The extent of the danger depends on intensity, wavelength and exposure time. Lasers are divided into categories in conformity with their dangerousness, and specific precautionary measures match each category. Lasers must always be delivered with satisfactory

instructions, and people who have not had the necessary training must not operate them. Everyone situated in an area where laser is used, must be informed of precautionary measures taken to avoid dangerous radiation.

### **Risk Factors**

- Direct and reflected radiation

### **Impact on Human Health**

- Risk of eye and skin injuries

### **Safety Measures**

- Never use a laser more powerful than necessary
- Never look into laser radiation and do mind reflections from shiny surfaces
- Always use radiation stop
- Turn off the laser when not in use

## **M2-EN.2.4 Demolition**

Demolition of buildings etc. must be planned and organized in order to carry the job securely into effect. Planning includes among other things estimation of the stability of the building during the demolition and inspecting material injurious to health in the building, whether the ground is polluted, and if exceptional environmental and safety precautions are necessary in relation to the surroundings. Experienced workers must always be part of the crew. Workers under the age of 18 are not allowed to participate in a demolition.

### **Risk Factors (M2.2.3.jpg)**

- Wires and conduits for electricity and gas which are not securely disconnected
- Risk of collapse
- Risk of formation of heavy dust clouds, impact from quartz and mineral wool
- Falls from height
- Falling objects
- Presence of asbestos

### **Safety Measures**

- Fencing of the site (M2.2.4.jpg)
- Make an action plan starting demolition from top
- Remove any asbestos products according to the process described by Regulations
- Use Safety Belts when working at Height
- Use safety helmets
- Use respiratory equipment when necessary
- Electricity wires and gas conduits must be dismantled by certified electricians

- Everyone uses the necessary means of personal protection

### **M2-EN.2.5 Gas Conduits**

The employees must be instructed in how to carry the job into effect. They must accurately know the regulations and have access to the written regulations. A person who can hurry to their rescue if necessary must supervise the employees. Everyone must be familiar with first aid at gas related accidents.

All employees must be informed about danger of accidents and illness and be instructed in precautions against fire, explosion, intoxication and suffocation.

#### **Risk Factors**

- Gas might occur in unhealthy concentrations

#### **Safety Measures**

- Always use metering apparatus and gas warning
- Use suitable and efficient breathing mask if necessary

### **M2-EN.2.6 Electricity**

Electrical installations must meet the existing regulations even when the installations are temporary. Panels must be secured in order not to tip over and they must be mounted in a way making them easy to operate. Feed cables for main panels and sub-panels must be suspended or buried. (M2.2.5.jpg)

Heavily dusting work must not take place near these panels.

Temporary cables and wires must be placed where they need to be moved as little as possible. It is an irresponsible act to leave feeding cables lying on the ground. Instead cables and wires must be buried, suspended or placed in specific cable chutes. Also cables must be protected from humidity. The installation must be design and executed by a licensed person. Safety devises must be used i.e. RCD 30mA

#### **Risk Factors**

- Tearing and destruction of cables
- Short circuit or seizure
- Cutting the cables when digging
- Contact with overhead cables
- Contact with damaged cables

#### **Impact on Human Health**

- In worst case electric shock might be lethal

#### **Safety Measures**

- Make sure that articles for everyday use are only connected to that voltage and sort of power which they are designed to

- Plugs, sockets and extension leads must be solid and faultless
- Cables in reel must be completely unreeled in order to reduce the risk of seizure
- Examine the tools if they show signs of defect
- Before digging, gather information on cables and wires within 10 meters from the working area
- Respect all safety rules when digging near high-voltage lines!
- Use sensitive protection devices i.e. RCD 30mA
- Inspect the electrical installation regularly
- When using lifting equipment or erecting scaffolds take into account the overhead cables

If an excavator hits overhead lines or cables, the driver must

- Stay in the excavator until the lines are dead
- Keep everyone else off the excavator
- Make sure that the utility company is informed

### **M2-EN.2.7 Assembling units**

Assembling of pre-cast concrete units and heavy construction units requires exact planning. The units should be delivered in the succession of which to assemble. They should be placed on the truck so that the crane can move them in succession and locate them in the right place in one manoeuvre. Storing units at a construction site must as far as possible be avoided.

Only personnel engaged in assembling units should stay nearby. Crane driver and ground assistant must all the time remain in contact. Swinging units should not pass over shacks or work places where regular assembling is not carried out.

#### **Risk Factors**

- Persons may be hit by hanging or swinging elements
- Faulty elements

#### **Safety Measures**

- Choose the right lifting equipment carefully, use them correctly, and be sure of their regular maintenance
- Before initializing the work, the units must be examined for cracks and faulty bearing surfaces, as well as the lifting equipment.
- Follow the instructions carefully when assembling

### **M2-EN.2.8 Crawlspace, Wells, etc.**

Persons working and staying in narrow rooms are exposed to heavy ergonomic strain on the whole body. Likewise, the risk of industrial accidents is increased and the character of the work may be a mental strain.

It may be necessary to draw up a plan for preparedness, evacuation and drill which contains information on the evacuation of possible injured persons.

Workers under the age of 18 are not allowed to work in closed rooms with danger of explosion or risk of suffocation. Persons working in wells normally have to wear a safety helmet and a lifting belt with lifting wire.

### **Risk Factors**

- Ergonomic strains
- Exposure to dust injurious to health
- Risk of suffocation or intoxication
- Danger of fire and explosions

### **Safety Measures**

- Crawlspace and wells must if necessary be cleaned up before initiating the work
- Check for the presence of toxic fumes
- Use the necessary means of personal protection
- When working in wells one guard must stand above the well and all the time remain in contact with the workers in the well. The guard must be equipped with the necessary rescue equipment and be able to use it correctly

## **M2-EN.2.9 Fire Protection and Open Fire**

Careful planning may prevent fire and explosions. Before initiating a job existing buildings must be examined for inflammables. Do observe:

- Whether inflammable materials, fluids or gasses are stored in the building
- Whether there are hollow spaces, which might contain inflammable materials, hidden cables, etc.
- Whether there are exhaust channels, which may transport inflammable fumes or dust.

When working in heat effective safety routines must be drawn up, and everyone must have received adequate instructions.

### **Safety Measures**

- Waste and used packing must be discarded frequently in suitable containers
- Watch out for creeping fire in small hollow spaces
- Smoking is prohibited where solvents are used and stored
- Always store welding equipment etc. securely
- Make sure to have a quick access to adequate fire fighting equipment
- Make sure that fire fighting equipment always is in proper condition and the workers are trained on how to use it

## **M2-EN.2.10 Welding**

Smoke from cutting and welding contains gasses and several heavy metals, which together may cause chronic injury on the respiratory passages if the pollution is not effectively removed. The skin must be protected against ultra-violet light and sparks. Welding light may cause permanent injuries on the eyes.

Symptoms of eye injuries caused by welding are hypersensitivity to light, watery eyes, swollen eyelids and severe pain in the eyes. Zinc ointment may be used to ease the pain. The ointment must not be used when working or driving due to its doping effect.

### **Risk Factors**

- Impact from gasses and heavy metals causing chronic bronchitis, cancer in the respiratory passages
- Impact from ultra-violet light causing acute and permanent injuries in the eyes
- Sparks and fire risk causing burns
- Risk of electric shock, when welding with electricity under humid conditions

### **Safety Measures**

- Make sure the exhaust is sufficient
- Minimise or eliminate the use of organic solvents for the degreasing process
- During welding, the overalls and gloves that are used, must be kept dry and in good condition
- Always use the necessary means of personal protection
- Do manage the equipment in conformity with the regulations