

Excavation and Trenching

Excavation works has an increased risk and should therefore be planned, executed and controlled so that the risks are eliminated. The risk involved in excavation works is mainly cave-ins and collapse. At Skanska, excavation works should always be carried out with efficient preparation and implementation process in order to achieve a high level of safety and productivity. If you are going to carry out excavation works at one of Skanska's workplaces, you must be aware of and follow the following procedures.

Organisation

Roles and Responsibilities

All excavation works in our workplaces shall be carried out by a named excavation supervisor. The excavation supervisor must be named at the tender stage and be approved by Skanska's production management.

The excavation supervisor shall be present at the workplace to the extent necessary to ensure that the day-to-day inspections are carried out and to take the decisions necessary for the safe execution of the work.

In the event of a longer absence of an excavation supervisor, a replacement approved by Skanska shall be appointed.

The excavation supervisor is responsible for:

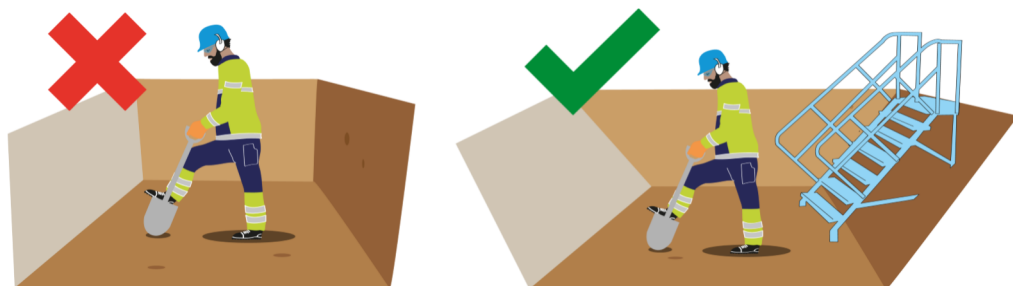
- planning, management and control of the excavation works
- risk assessment and work preparation being carried out.
- drawing up a control plan based on identified risks. The control plan shall include routines for daily inspection.
- geotechnicians being used when necessary, for example in situations that are difficult to assess.

Skanska's production management has a designated person for the coordination of excavation contractors and a project-dedicated geotechnician for support. If you are going to do excavation works, you need to know who has these roles in the workplace.

Competence Requirements

The excavation supervisor must be able to certify the approved training "Excavation Supervisor – Safe Excavation" and experience of similar work.

All who plan, are responsible for and work on or in the vicinity of excavations at one of Skanska's workplaces must carry out Skanska's digital training session "Safe excavation and trenching" before work begins. This course is available on www.skanska.se/en-us/digitaltraining. In order to ensure that the right conditions are included in the tendering process, this training course must have been completed before the tender is submitted.



Take care of yourself and think about the conditions before you enter an excavation. The risk of collapse must be managed and there must be a safe access and escape route.

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Planning

When planning an excavation, considerations shall be taken to excavation depth, soil classification, prevailing groundwater situation and existing and surcharge loads and other operations in the vicinity of the excavation. Project-specific work preparation must be submitted in connection with the tender and be included in Skanska's tender evaluation.

Excavations are often temporary structures and this must be taken into account as early as during the planning work.

The planning shall result in the following actions (in chronological order):

- Referral documents for review and approval by Skanska
- Review documents for review and approval by the Developer
- Work documents e.g. implementation descriptions, control programmes, drawings, excavation models, as a basis for work preparation
- As-Built documentation once work is completed

If the conditions for the completed planning are changed while work is in progress, new planning will be required that takes into account the new conditions.

Excavations without protective systems for collapse can be designed by the excavation supervisor in the project according to instructions from Skanska's production management. Geotechnicians will have to be consulted if the situation is difficult to assess.

Always consult geotechnicians if:

- The ground less than 1 metre behind the excavation edge will be subjected to loads from, for example, machinery or storage dump.
- A temporary excavation in clay that would be open for more than a week.
- There is a risk that excavation-induced movement may damage existing adjacent buildings, wiring etc.
- A collapse protection system must be used. Collapse protection systems are a complement to safe open excavations with sloping walls.

Safe Execution

To ensure that the work can be carried out safely, the excavation supervisor must review the document *Checklist before starting excavation work*, which is provided by Skanska's production management.

Execution is subject to:

- The excavation supervisor leading the excavation work according to planned work preparation, which is reviewed with all relevant personnel before the start of the work.
- The team being responsible for carrying out the work in accordance with the work preparation.
- Persons in the team may not be replaced without the approval of the excavation supervisor.
- Daily briefings with the team are carried out in the morning before work begins.
- Daily inspection of the excavations is carried out before work commences, usually in the morning, by the excavation supervisor or by a designated person with experience and training for the task.
- All persons involved in excavation work must have experience and relevant training for each task.
- Only authorised personnel may be in the excavation.
- Work in the excavation trench may only be carried out alone in exceptional cases according to risk assessment and work preparation.
- The machinist must have an overview of the excavation trench in order to be aware of and act on any changes, the machinist should therefore only exceptionally be down in the trench.
- All persons involved in the work should pay attention to movements, fissures, slope erosion and other signs of instability.
- If a deviation from the current work document is observed, the work should be immediately interrupted and the excavation supervisor or the nearest supervisor contacted. Everyone has a mandate to interrupt work.
- The project's geotechnician should be contacted in case of deviations in geotechnical conditions from work documentation and when the deviation requires new planning.