



SCOPE | Collective protection measures for trench edges. Temporary fencing off of trench edges during earthworks. Marking of trenches.

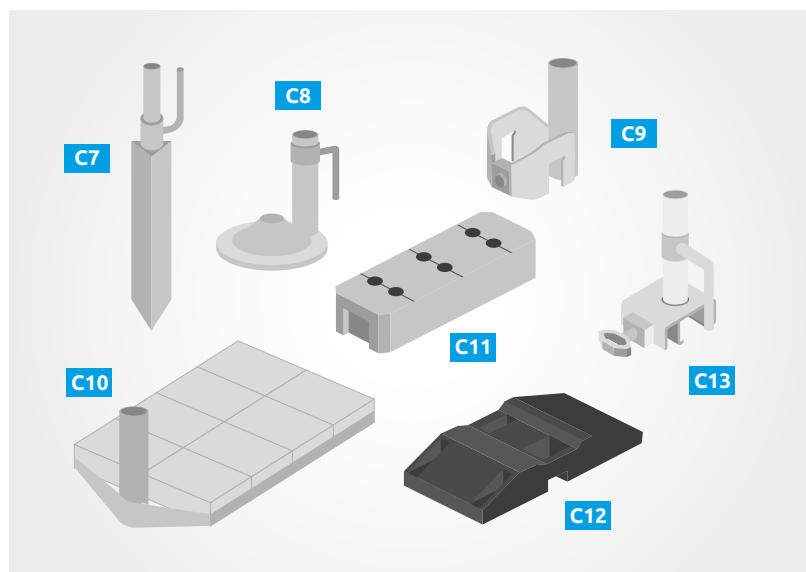
GENERAL RECOMMENDATIONS:

- Ensure the planned and adopted solutions are included in ISPW, which is an obligatory appendix to the HASP schedule.
- Analyse stages of earthworks.
- Plan designation of temporary zones for earthworks.
- Provide warning signs for earthworks zones.
- Take into account methods for securing slopes when planning collective protection measures for a trench.
- Take into account methods for securing walls when planning collective protection measures for a trench.
- Plan target - modular collective protection measures for trench edges.

Remember – When selecting modular solutions for collective protection measures, plan securing of trench slopes, traffic routes, and a location and a way for descending into a trench.

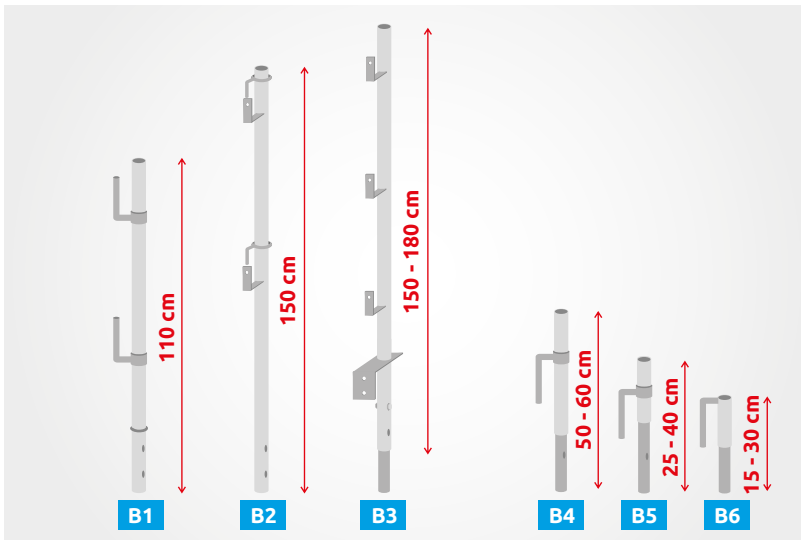
When a ground where earthworks are conducted cannot be secured, other effective technical and/or organisational solutions must be used, or continuous supervision must be ensured.

Collective protection measures for trench edges



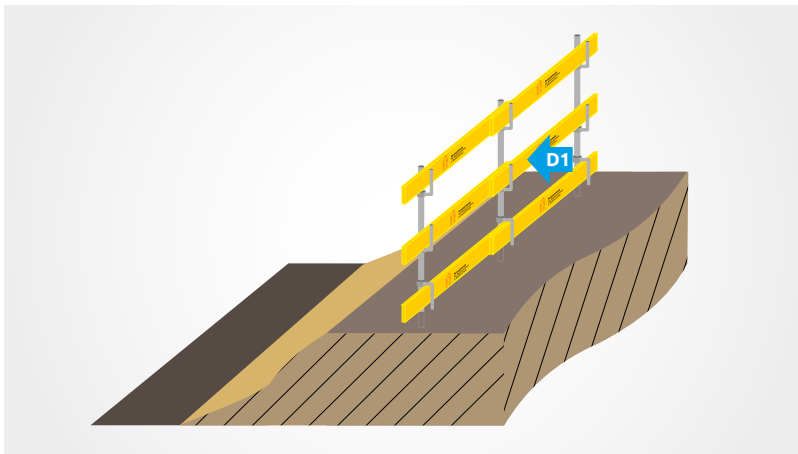
Select appropriate holder. Every supplier specialising in collective protection measures systems for trenches has a dedicated solutions.

- C7 Driven in holder
- C8 Screwed in holder
- C9 Holder for steel sheet piles
- C10 Holder with a counterweight
- C11 Concrete foot
- C12 PVC foot
- C13 Adjustable jack holder for formworks



Use a post of appropriate height, taking into account a difference in the ground. A solution with a post and a post extension of sufficient height can also be used.

Presented post extensions are examples, and their length can vary, depending on a supplier.



Protective planks for safety handrails and toeboards made of sawn timber of the following parameters:

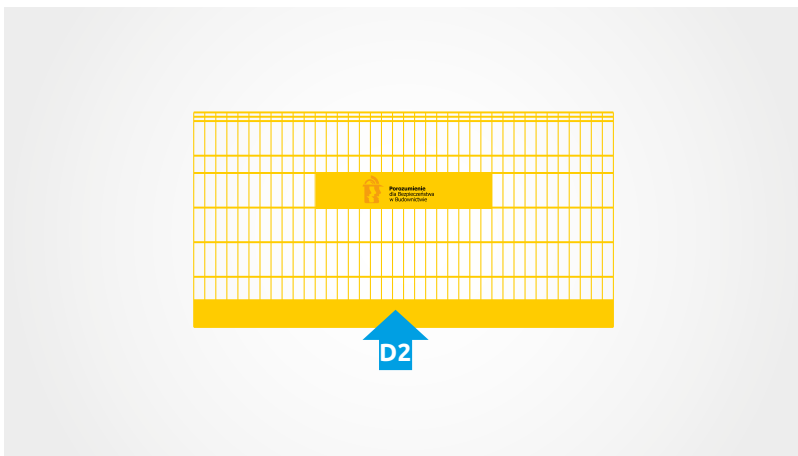
- strength class at least C18 C22 (according to PN-EN 338),
- max. water content of sawn timber 23%

Plank dimensions:

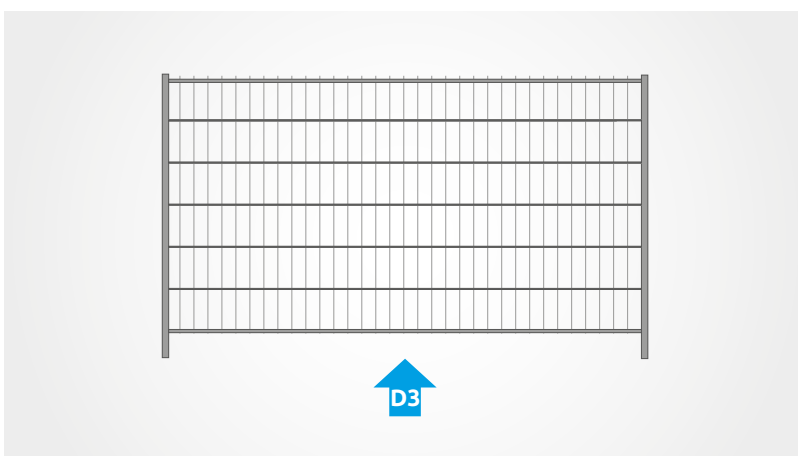
Maximum length 2500 mm for a maximum distance between posts of 2000 mm

Thickness 32 mm

Width 150 mm.



A safety mesh is used to protect against fall from height of people and tools.



Openwork mesh used for temporary (warning) fencing off of trenches.

Openwork mesh is not a modular collective protection measure for trenches.

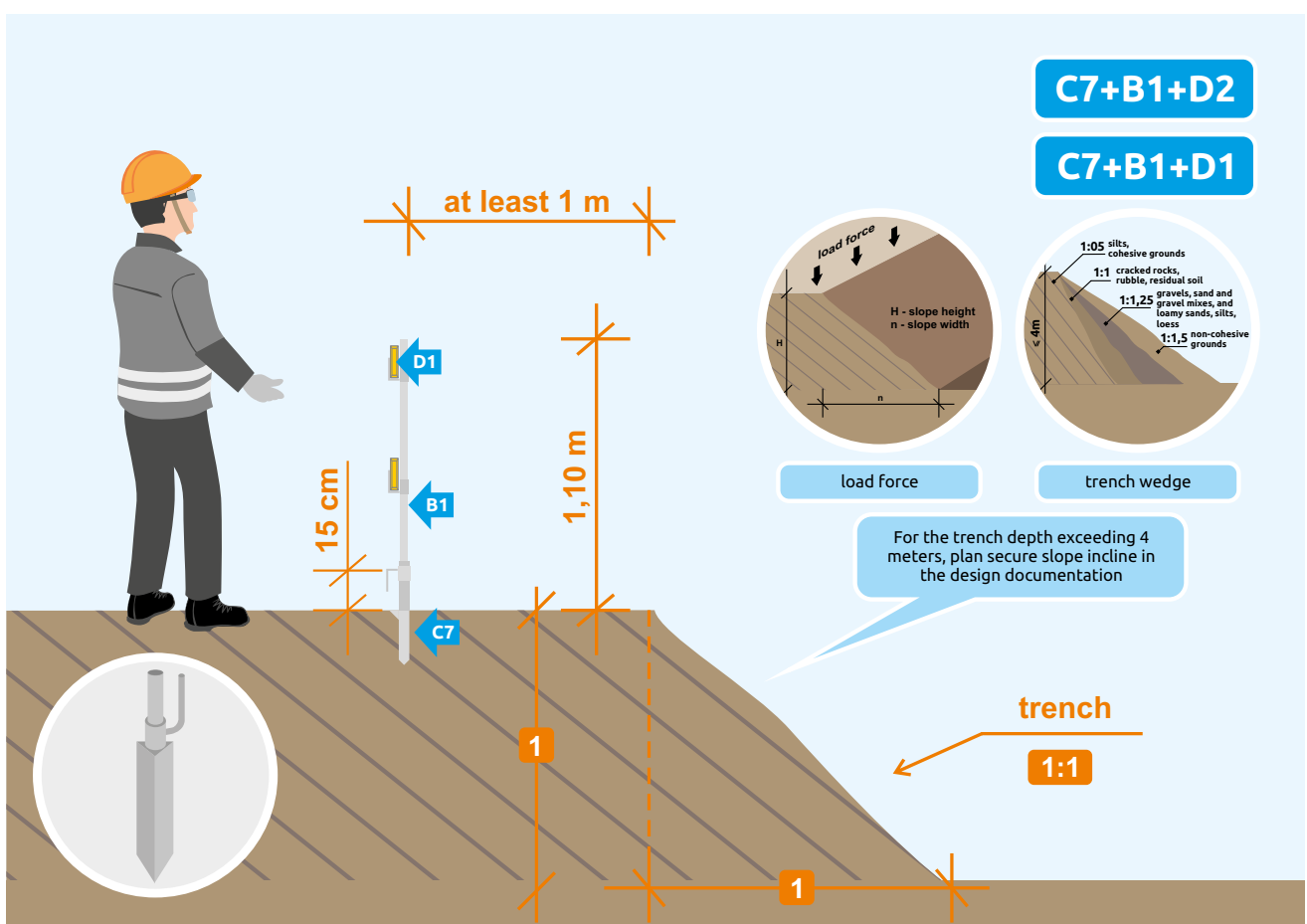
GUIDELINES FOR SECURING EDGES OF TRENCHES WITH A SAFE SLOPE INCLINE

- Verify type of the ground
- Check stability of the slope and trench bottom
- Determine a trench wedge
- Specify a safe slope incline
- Consider the use of surface protection, e.g., geotextile

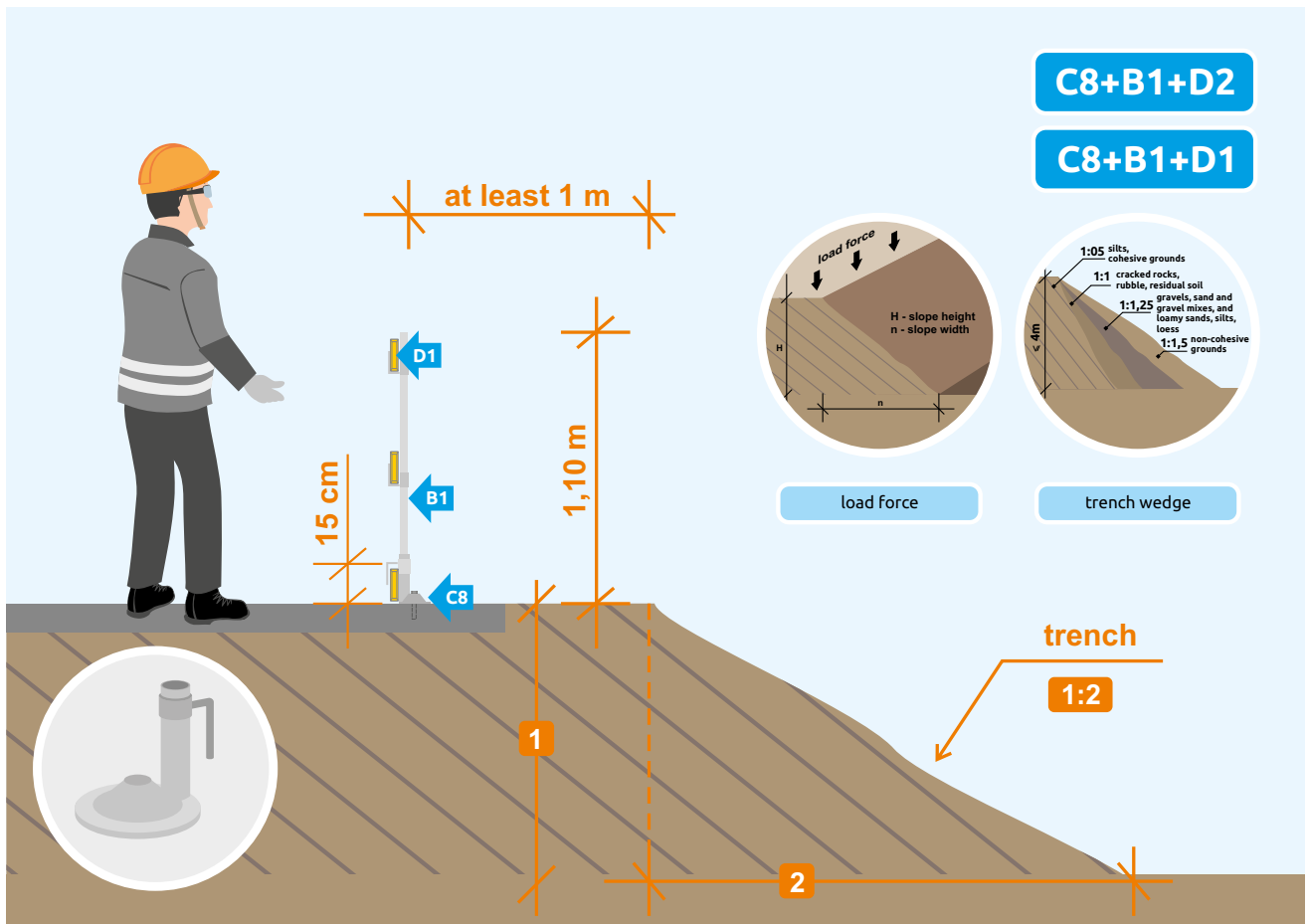
Securing of trench edges

- Construction of a permanent securing of edges using a modular barrier (in form of a safety handrail at a minimum height of 110 cm, an intermediate rail, and a 15-cm-high toeboard) or a protective mesh installed at a distance of at least 100 cm from the trench edge.
- The use of a driven in holder, a holder with a counterweight, or a screwed in holder.

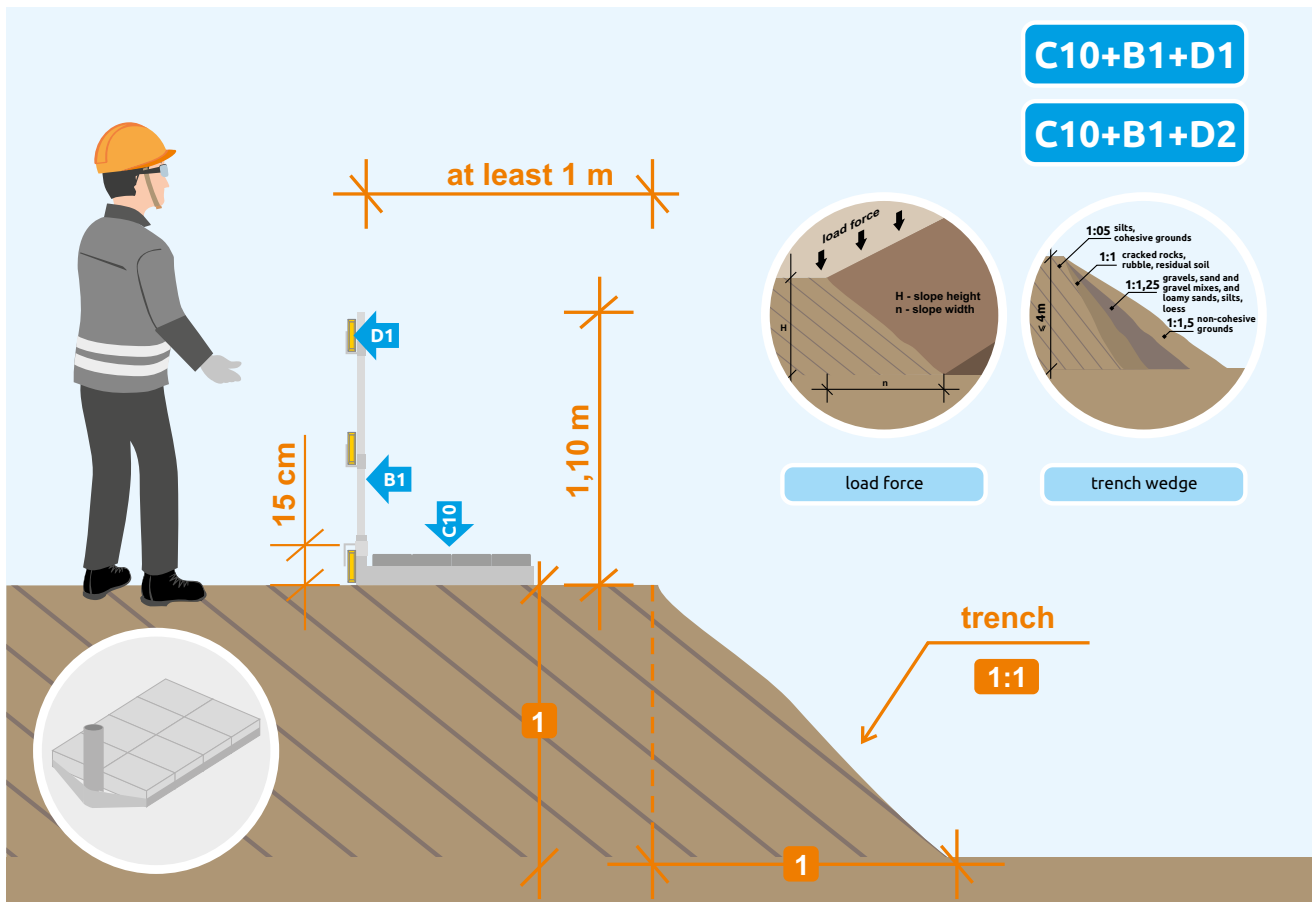
Protective measures installed in the ground, using a driven in holder



Protective measures installed in a concrete slab, using a screwed in holder



Protective measures installed in a concrete slab, using a holder with counterweight



To stabilise a holder with a counterweight, use concrete blocks of specific dimensions and weight, according to a dedicated solution of a manufacturer.

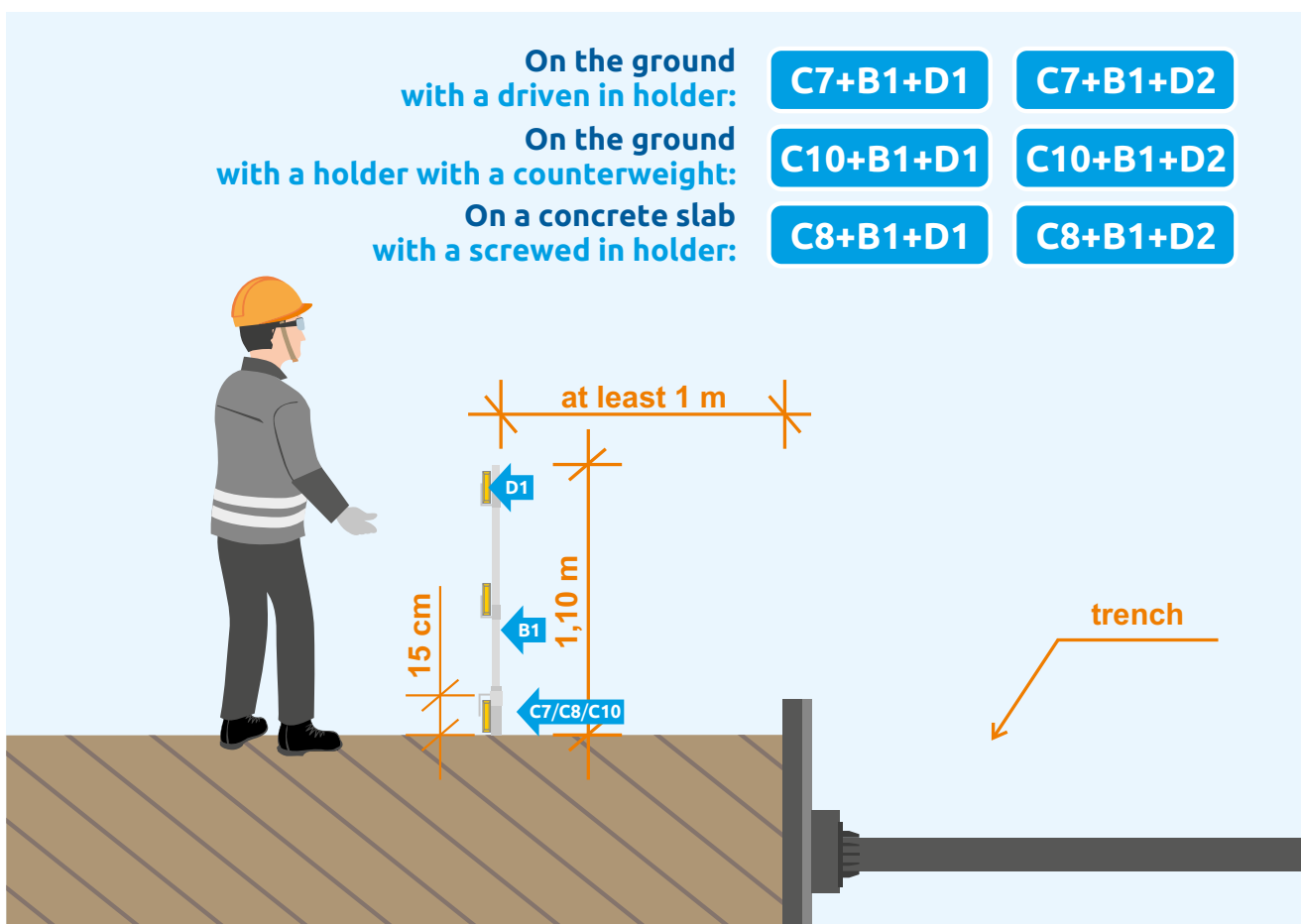
GUIDELINES FOR SECURING EDGES OF TRENCHES USING PROTECTION OF TRENCH WALLS

- Select appropriate measures to secure trench walls (most commonly used: steel sheet piling, e.g., Larsen sheet piling, diaphragm wall, palisade, or Berliner wall)

Securing of trench edges

- Construction of a permanent securing of edges using a modular barrier (in form of a safety handrail at a minimum height of 110 cm, an intermediate rail, and a 15-cm-high toeboard) or a protective mesh installed at a distance of at least 100 cm from the trench edge.
- A driven in holder or a sheet pile holder is usually used. In justified case, a screwed in holder or a holder with a counterweight can also be used (see diagrams for solutions shown above).

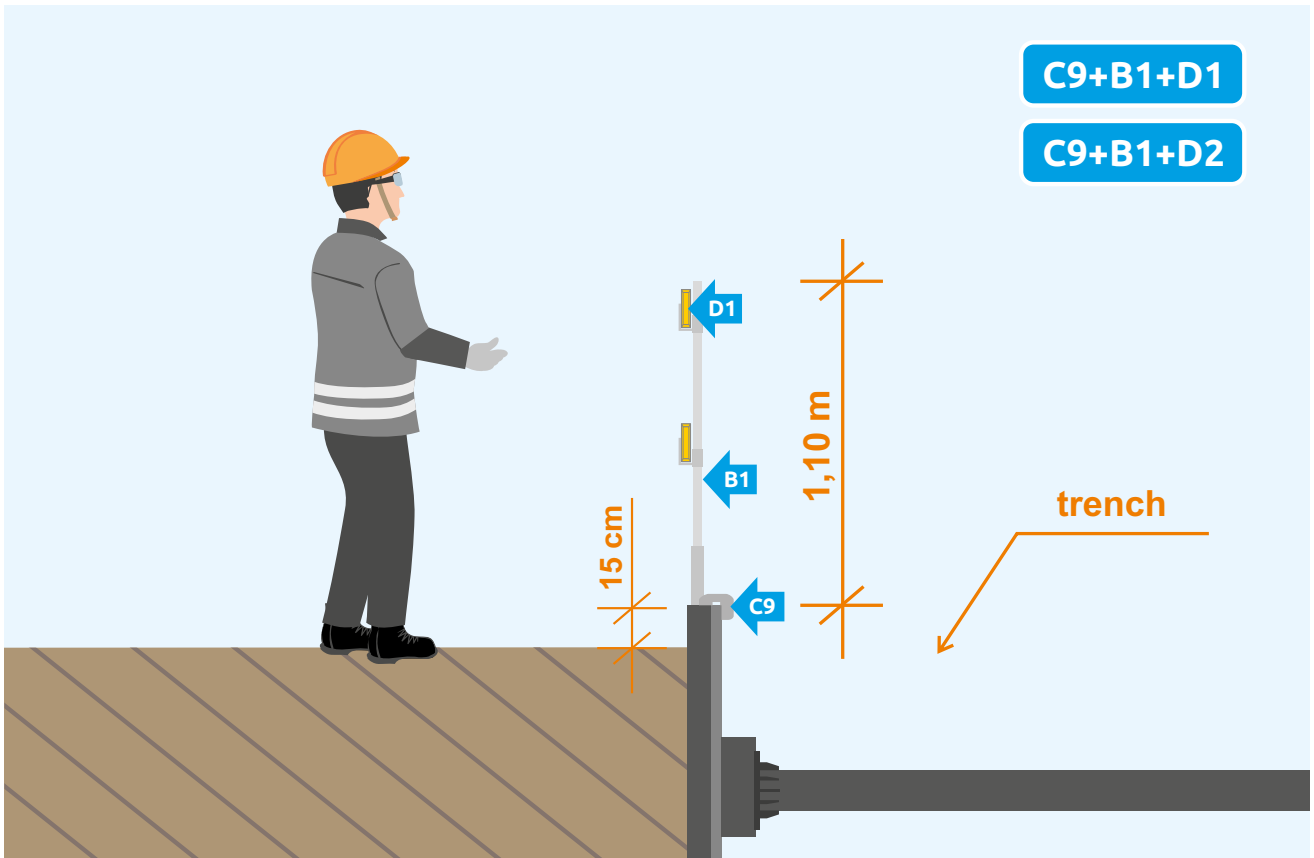
Protective measures installed in the ground, using a driven in holder, when trench walls are secured by steel sheet piling, e.g., Larsen sheet piling



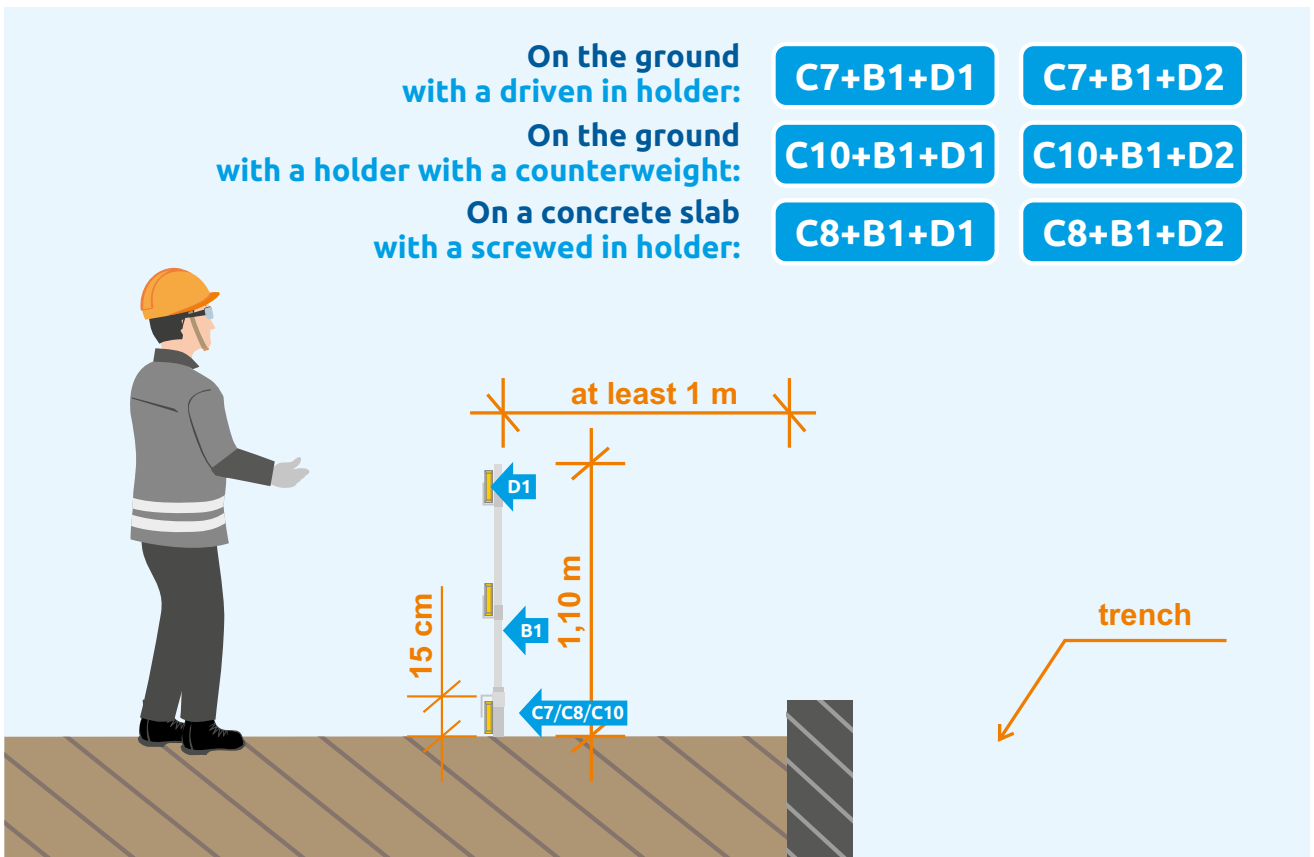
In this system, two types of holders can be used: a driven in holder or a holder with a counterweight. When the ground surface is covered with a concrete slab, a screwed in holder is used.

See diagrams for solutions presented above.

Protective measures installed on steel profiles using a holder for sheet piling, when trench walls are secured by steel sheet piling, e.g., Larssen sheet piling



Protective measures installed in the ground, using a driven in holder, when trench walls are secured by a diaphragm wall, JET-Grouting palisade, or the Berliner wall



In this system, two types of holders can be used: a driven in holder or a holder with a counterweight. When the ground surface is covered with a concrete slab, a screwed in holder is used.

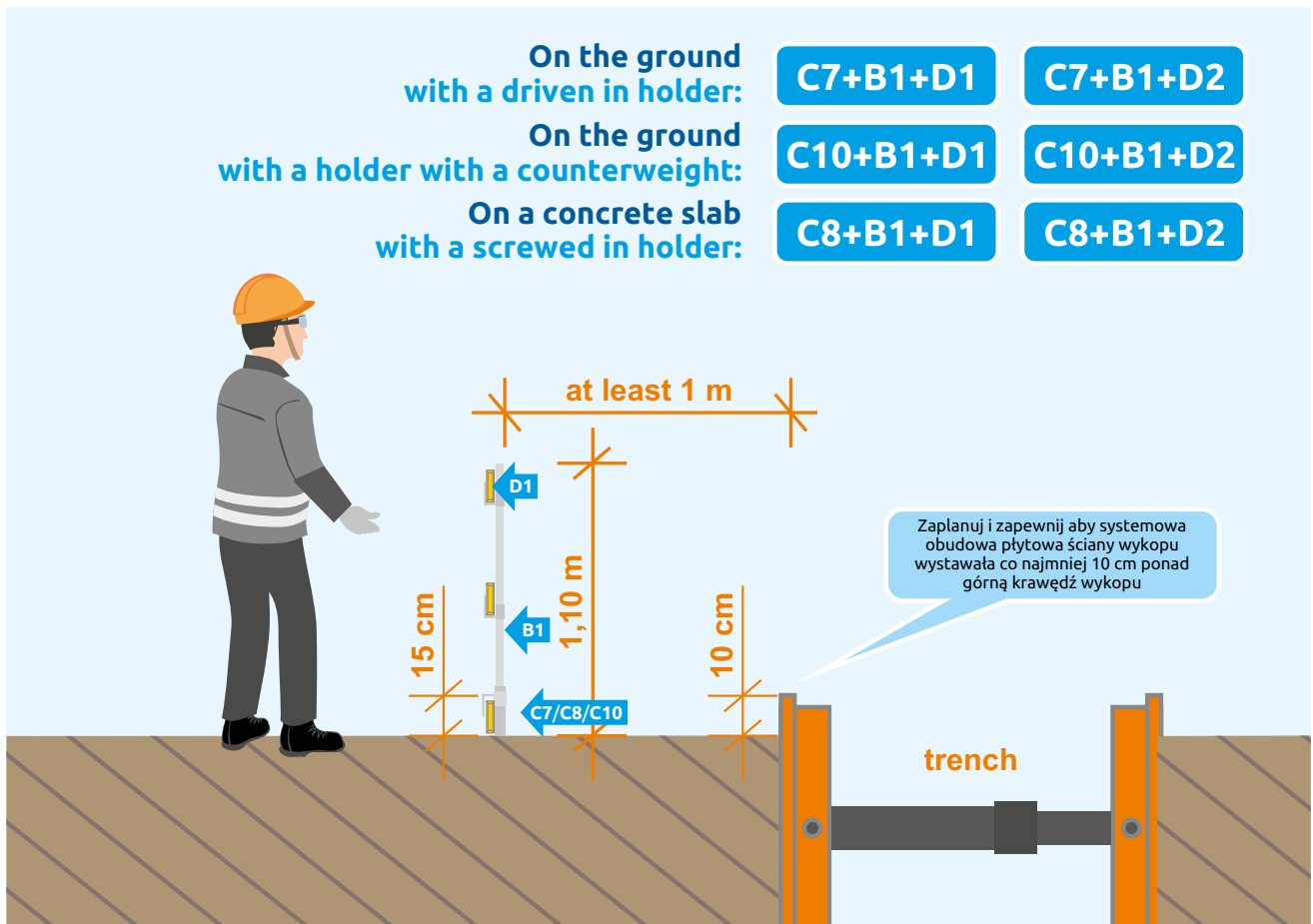
See diagrams for solutions presented above.

GUIDELINES FOR SECURING EDGES OF TRENCHES USING MODULAR WALLS FOR NARROW (LINEAR) TRENCHES

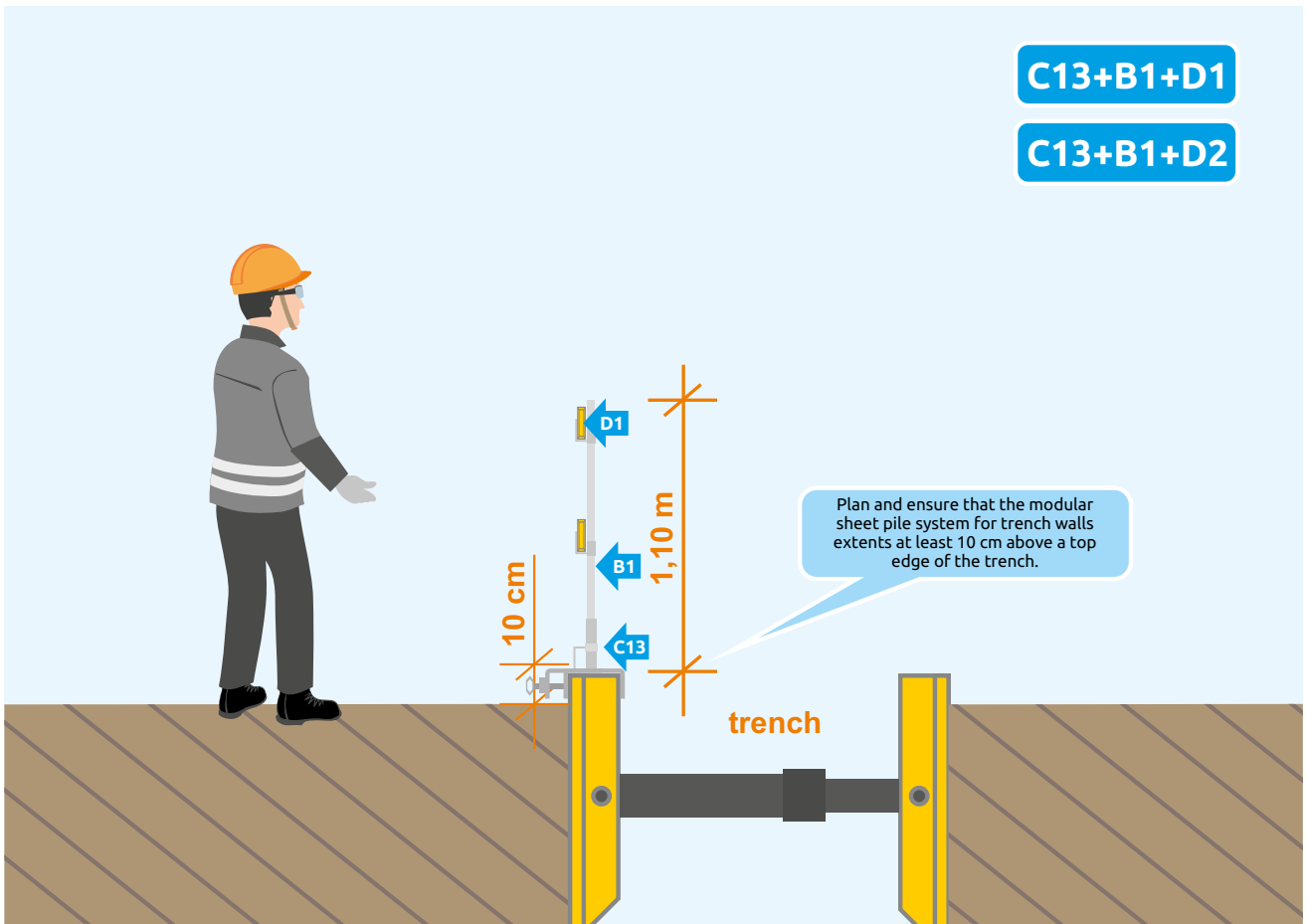
- Select appropriate modular walls for securing walls of narrow trenches.

Securing of trench edges

- Construction of a permanent securing of edges using a modular barrier (in form of a safety handrail at a minimum height of 110 cm, an intermediate rail, and a 15-cm-high toeboard) or a protective mesh installed at a distance of at least 100 cm from the trench edge.
- A driven in holder is usually used. In justified case, a screwed in holder or a holder with a counterweight can also be used (see diagrams for solutions shown above).



In this system, two types of holders can be used: a driven in holder or a holder with a counterweight. When the ground surface is covered with a concrete slab, a screwed in holder is used. See diagrams for solutions presented above.



GUIDELINES FOR SECURING A TRENCH WITH ACCESS OF THIRD PERSONS

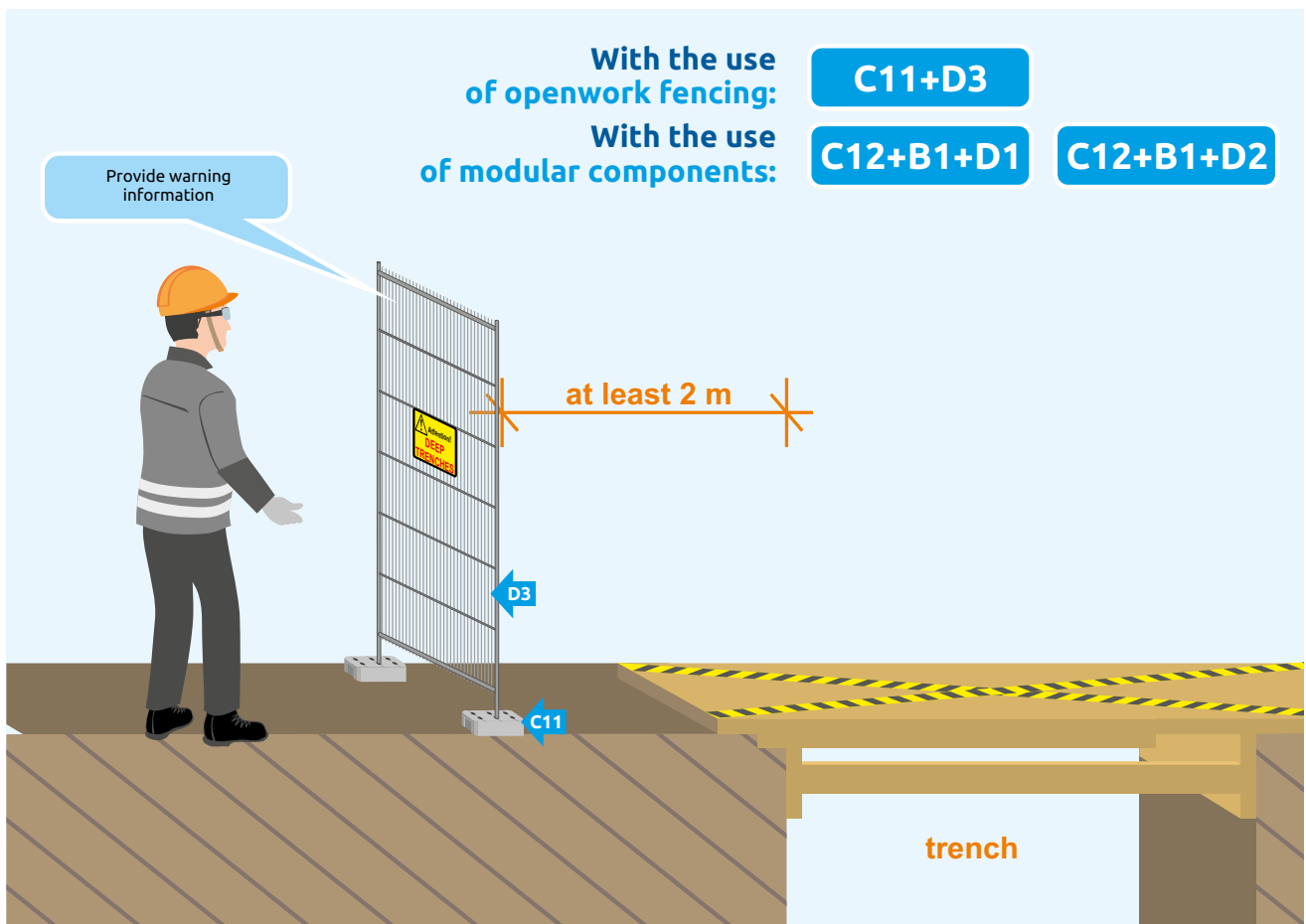
- Select an appropriate tight cover for the trench.

Warning fencing off of the secured trench for third persons

- Construction of permanent securing of edges using a modular barrier (in form of a safety handrail at a minimum height of 110 cm and an intermediate barrier) or a protective mesh installed at a distance of at least 200 cm from trench edges.
- A driven in holder is usually used. In justified case, a screwed in holder or a holder with a counterweight can also be used (see diagrams for solutions shown above).

With the use of openwork fencing.

With the use of modular posts and planks or safety mesh.



GUIDELINES FOR TEMPORARY FENCING OFF OF TRENCHES DURING EARTHWORKS WHEN COLLECTIVE PROTECTION MEASURES CANNOT BE INSTALLED

- Plan stages for earthwork performance.
- Provide temporary fencing off of trench edges during earthworks.
- Plan installation of target - permanent collective protection measures for trenches.

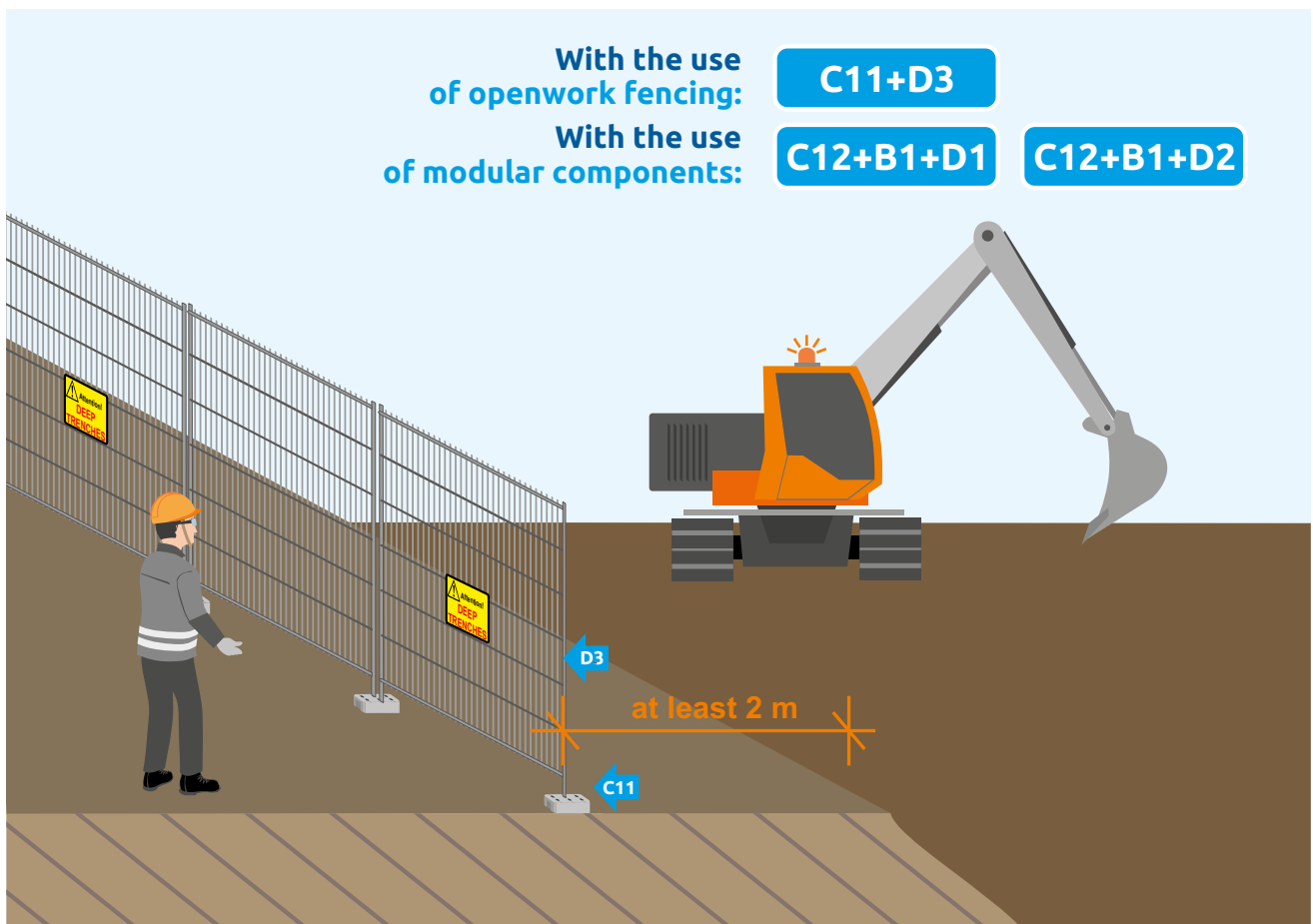
Note: Temporary protection measures are not permanent collective protection measures - they have a warning function, as an additional measure for other collective protection measures. They are used to fence off trench edges during short earthworks, up to one work shift, with a continuous supervision of people working on the trench.

Temporary fencing off of trench edges during earthworks:

- Construction of temporary securing of edges using a modular barrier (in form of a safety handrail at a minimum height of 110 cm and an intermediate barrier) or a protective mesh installed at a distance of at least 200 cm from trench edges. Use of a PVC foot.
- Construction of temporary securing of edges using openwork mesh and a concrete foot placed at least 200 cm from the trench edge.

(See diagrams for solutions presented above).

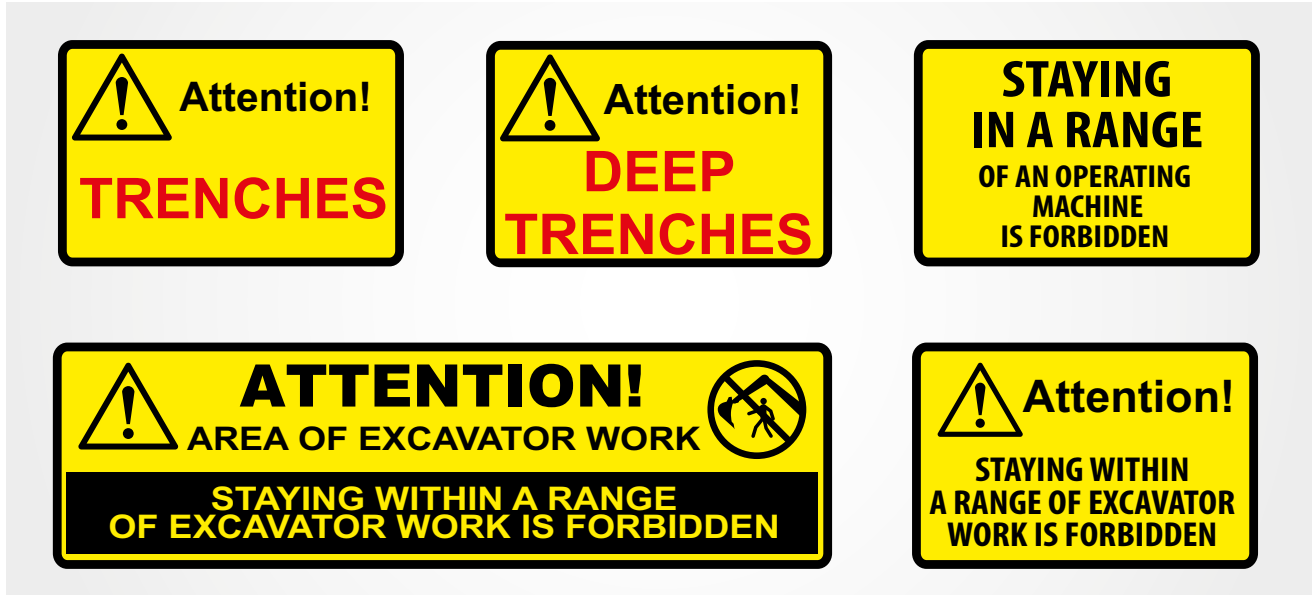
Temporary protection of trenches



GRAPHIC MARKING OF TRENCHES

- Each trench must be marked in a visible location - on each side at pedestrian and vehicle traffic routes.
- Signs are installed at a height of a top safety barrier, and when higher protection measures are used (e.g.: openwork mesh) - at a height of ca. 150 cm.
- Signs are installed at specific distances, taking into account good visibility - every 6 module of a modular collective protection measure is recommended.

Examples of graphic signs:



The sign is placed on every 6 module of collective protection measure

