ERGOCAD®

GROUND INVESTIGATION TESTING – Design investigations
The depth of investigation shall be extended to all strata that will affect the project or the construction.
Recommendations for the spacing and depth of investigations
(I) The following spacing of investigation points should be used as guidance:
− for high-rise and industrial structures, a grid pattern with points at 15 n1 to 40 m distance;
− for large-area structures, a grid pattern with points at not more than 60 III distance;
− for linear structures (roads, railways, channels, pipelines, dikes, tunnels, retaining walls), a spacing of 20 III to 200 m;
− for special structures (e.g. bridges), two to six investigation points per foundation;
− for dan1s and weirs, In to 75 In distance, along relevant sections.
(2) For the investigation depth Za the following values should be used as guidance. (The reference level for Za is the lowest point of the foundation of the structure or structural element, or the
excavation base.) Where more than one alternative is specified for establishing Za, the one which yields the largest value should be applied.
NOTE For very large or highly complex projects, some of the investigation points generally extend to greater depths than those specified under B.3 to B.3 (13).

(3) Greater investigation depths should always be selected, where unfavorable geological conditions, such as weak or compressible strata below strata of higher bearing capacity, are
presumed.
(4) Where structures under B.3 (5) to B.3 (8) and B.3 (13) are built on competent strata, the depth of investigation can be reduced to Za 2 m, unless the geology is indistinct, in which case at least
one borehole should be taken down to a minimum of Za = 5 m. If a bedrock formation is encountered at the proposed base of the structure, this should be taken as the reference level for Za.
Otherwise, Za refers to the surface of the bedrock formation.
(5) For high-rise structures and civil engineering projects, the larger value of the following conditions should be applied (see Figure B.I):

Za>6 m;
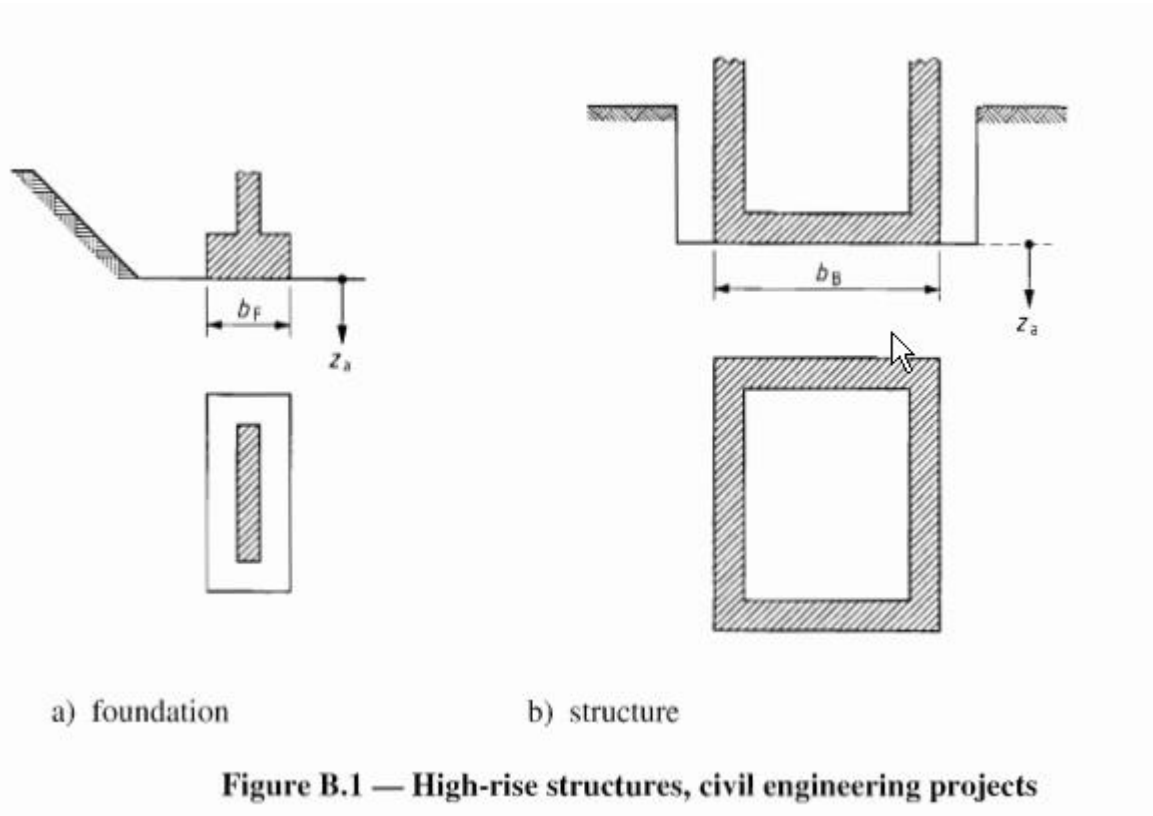Za>3BF.
where BF is the snlaller side length of the foundation.

(6) For raft foundations and structures with several foundation elements whose effects in deeper strata are superimposed on each other:
Za>1,5bB
where bB is the sn1aller side of the structure, (see Fig. B.I).

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a) foundation   b) structure

Figure B.1 — High-rise structures, civil engineering projects

(7) En1banklnents and cuttings, the larger value of the following conditions should be met Figure B.2):

a) embankment   b) cutting

Figure B.2 — Embankments and cuttings
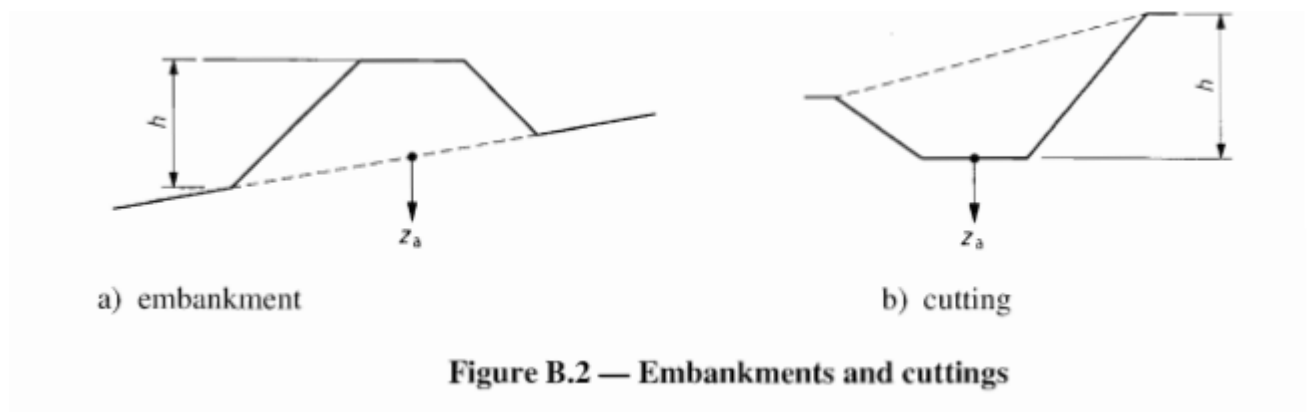
For dmns:
$0,8h < Za < 1,2h$
$Za > 6m$
where h is the embankment height.

b) For cuttings:
$Za > 2,0m$
$Za > 0,4h$
where h is the dam height or depth of cutting.

(8) Linear structures, the larger value of the following conditions should be nlet (see Figure B.3):

Figure B.3 — Linear structures
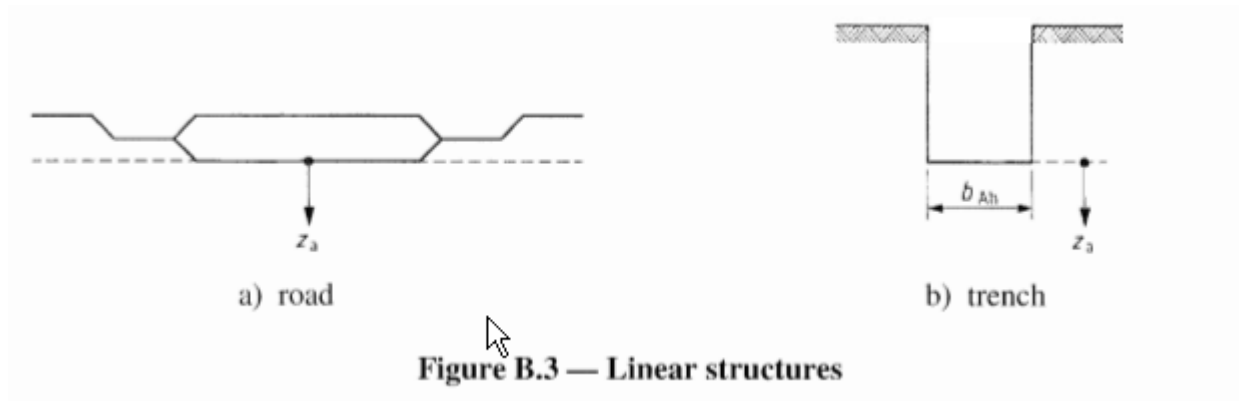
a) For roads and airfields:

Za>2 In below the proposed formation level.

b) For trenches and pipelines, the
Za 2>2m In below the invert level;
Za 2>1,5bAh
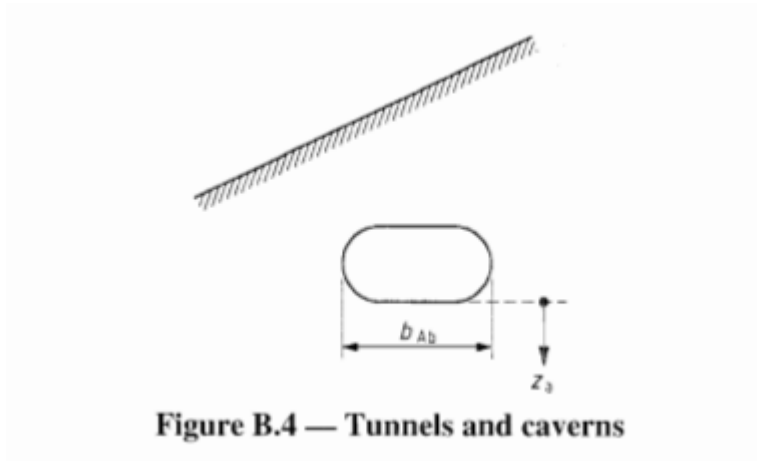where bAh is the width of excavation.

value of:
b) trench
c) Where relevant, the recommendations for embankments and cuttings should be followed

(9) For sma tunnels and caverns, (see Figure B4):

bAb<Za<2bAb

where bAb is the width of excavation.

The groundwater conditions described in (10) b) should also be taken into account.

Figure B.4 — Tunnels and caverns

a) Where the piezometric surface and the groundwater tables are below the excavation base, the larger value of the fonowing conditions should be met:

$Z_a > 0,4h$

– $Z > (t + 2,0)$ m

where

t is the embedded length of the support; and h is the excavation depth.

b) Where the piez01netric surface and the groundwater tables are above the excavation base, the larger value of the following conditions should be met

$Z_a > (1H + 2,0)$ m

$Z_a > (t + 2,0)$ m

where

H is the height of the groundwater level above the excavation base; and t is the embedded length of the support.

a)   b)

Key

1   groundwater

Figure B.5 — Excavations
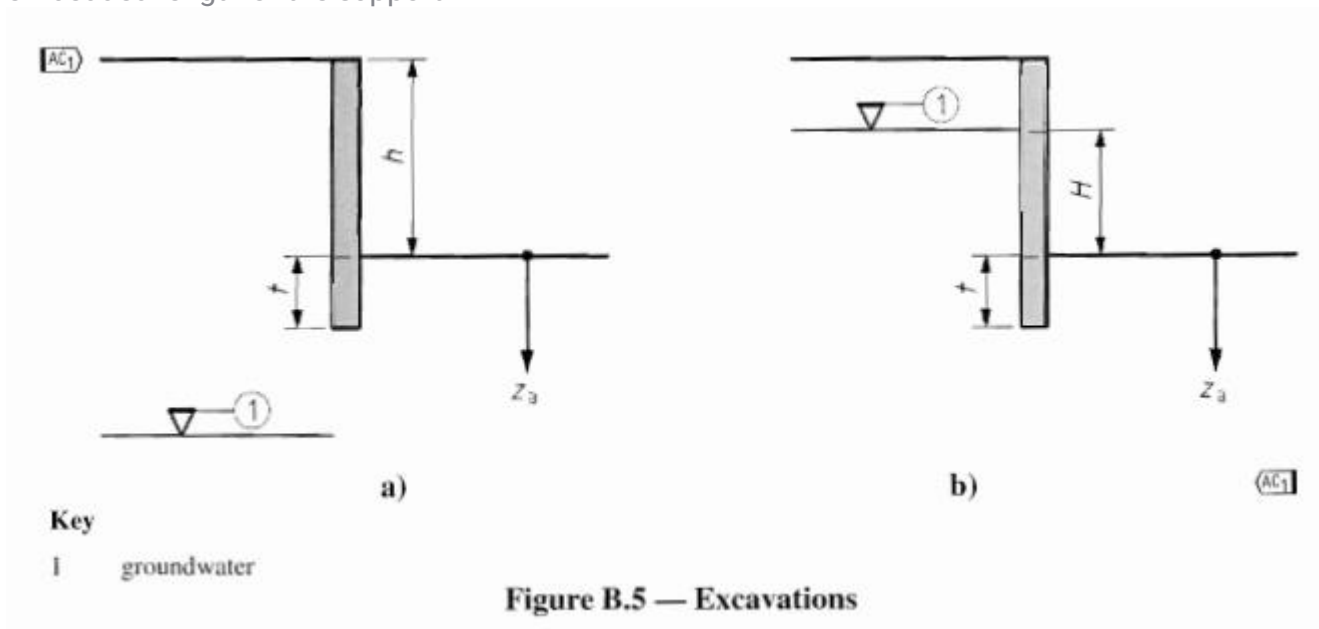
For water-retaining structures, Za should be specified as a function of the proposed level of impounded water, the hydrogeological conditions and the construction method.

(12) For cut-off walls (see Figure B.6):

Za>2m below the surface of the stratum impermeable to groundwater.

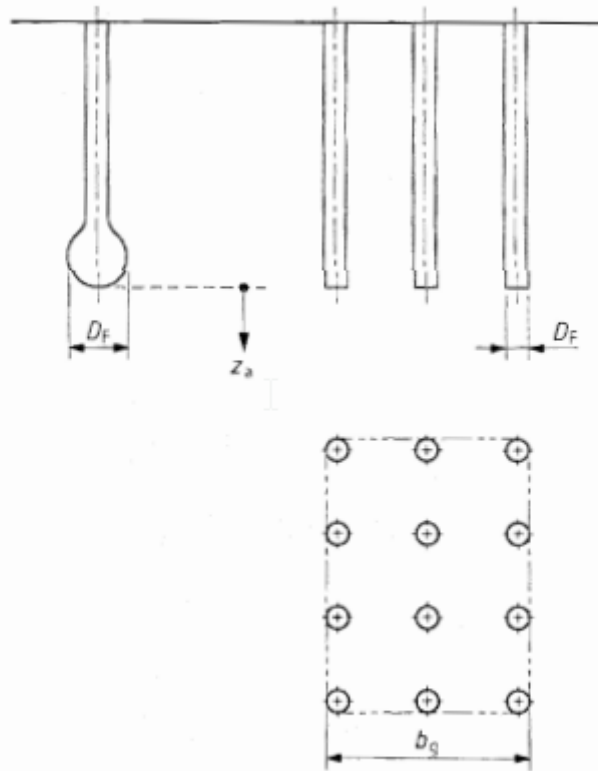**Figure B.6 — Cut-off wall**
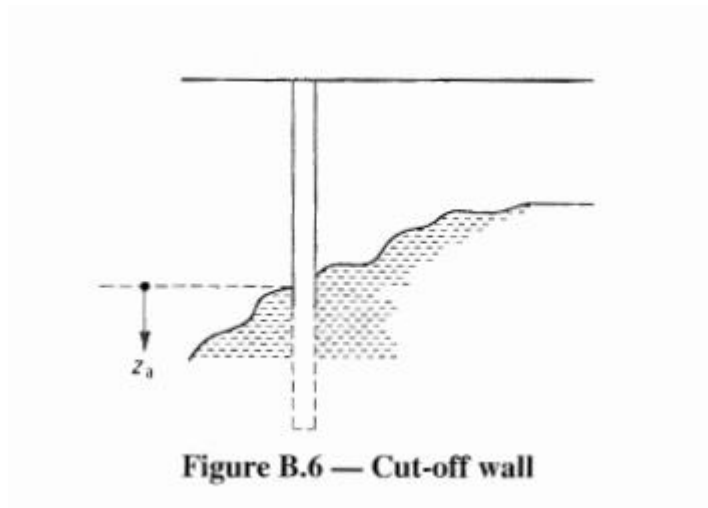
(13) For piles (see Figure B.7), the following three conditions should be met:

Za >1bg

Za >5,0 m

Za>3DF

Figure B.7 — Pile groups

where
DF is the pile base diameter; and bg is the smaller side of the rectangle circumscribing the group of piles forming the foundation at the level of the pile base.