

TC 250 SC7 EG 9

Water pressures

Results from face to face discussion in Vienna

Some 40 former proposals to SC-7-Maintenance-Group for Modifications concerning topics of water pressures were discussed - [agreement on answers](#)

3 situations with water actions are under special consideration:

- hydraulic failures
- uplift
- constructions directly objected to effects of water

water pressures

characteristic and design values (1)

agreement: no partial factors on

- unit weight of water or
- water pressures

agreement on characteristic water pressure:

The characteristic piezometric water levels and accordingly the characteristic values of water pressures shall correspond to a

recurrence period at least equal to the duration of the design situation of the structure. (e.g. 100 years)

This has to be done by considering hydrological, hydrogeological and environmental information together with statistical analysis, if suitable data is available.

agreement on accidental situations (technical, not natural)

water pressures

characteristic and design values (2)

agreement on design value of water pressure:

The ultimate limit state design value of ground water pressures shall represent a
specified rare probability in the duration of the design situation
(e.g. 10000 years)

It may be derived either

- by **direct assessment**.
- by adding a **margin** to the characteristic piezometric water level

NOTE: The value of the specified probability may be set by the national annex.

NOTE The recommended value of the probability is 1 %.

water pressures

characteristic and design values (3)

first agreement on handling hydraulic failure and uplift:

No factors on effects of water pressure should be used for HYD- and UPL- (and EQU-) Verifications

- maybe we need changed partial factors on stabilising forces to count for robustness
- phrasing is still missing for final agreement.
- It is not a factor of 1.00
- no factor shall be used, but directly effects due to design water table

water pressures

characteristic and design values (4)

first agreement on effects of actions on constructions:

Ultimate limit state design values
for STR- (and GEO-?) limit states
may also be based on application
of partial factors to structural effects
due to characteristic water pressures.

In this case it should be checked if an extreme raised water table could directly affect the construction.

- phrasing is still missing for final agreement.

Hydraulic Failure

first agreement concerning (Eq 2.9) HYD:

$$S_{dst;d} \leq G'_{stb;k} \cdot \gamma_{G;stb}$$

– we will need a changed partial factor $\gamma_{G;stb}$

+ $R(\phi+c)_d$; (still open to discussion)

$S_{dst;d}$ due to design value of water pressure

Terzaghi block may be a good choice for verification
hints on anisotropic and inhomogeneous permeability,
hints on influence of geometry

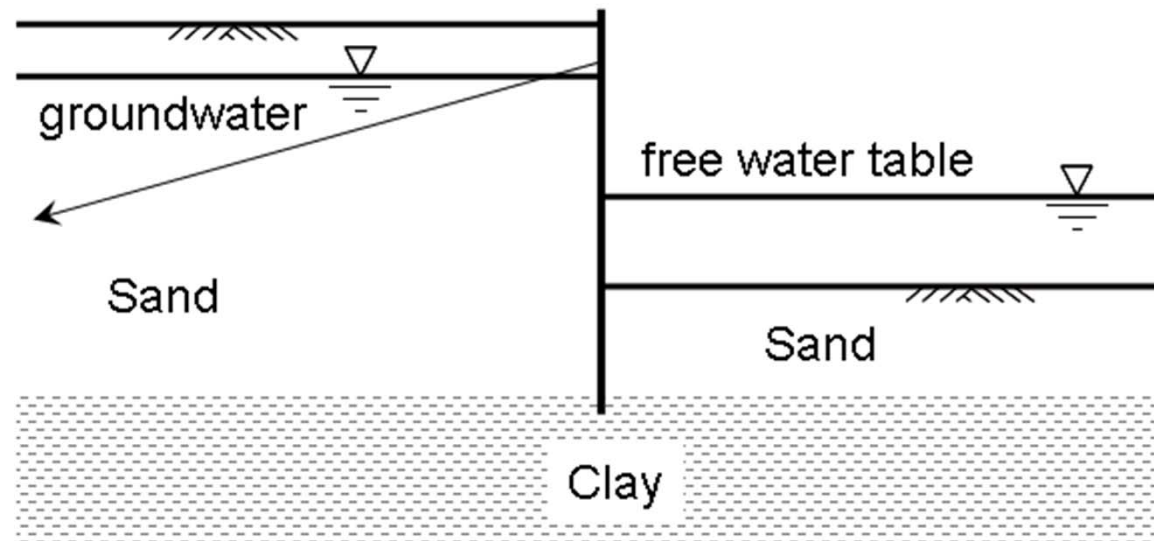
- phrasing is still missing for final agreement.

still open to discussion: $(u - u_{hydrostatic}) \leq (\sigma_v - u_{hydrostatic}) \cdot \gamma_{G;stb}$

dutch verification against critical gradient (wall embedment in clays)

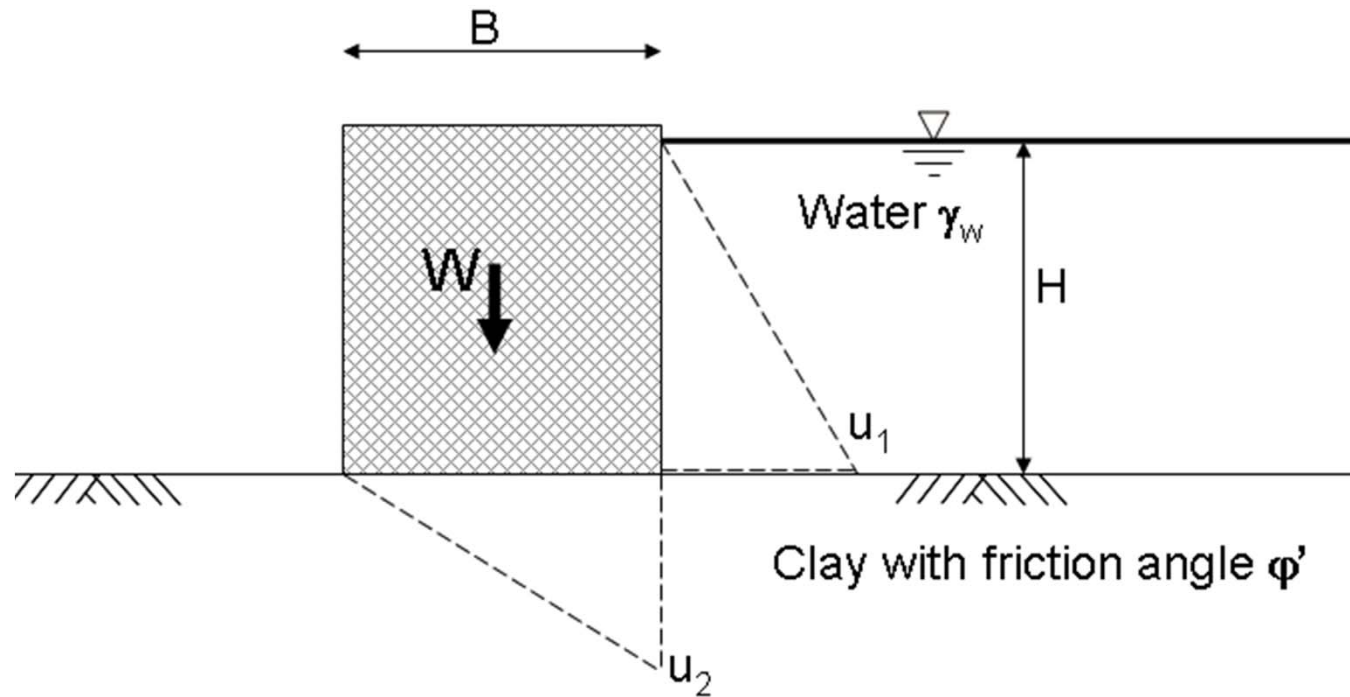
STR

d



GEO

d



bearing capacity?

Sliding?

EQU

d

