

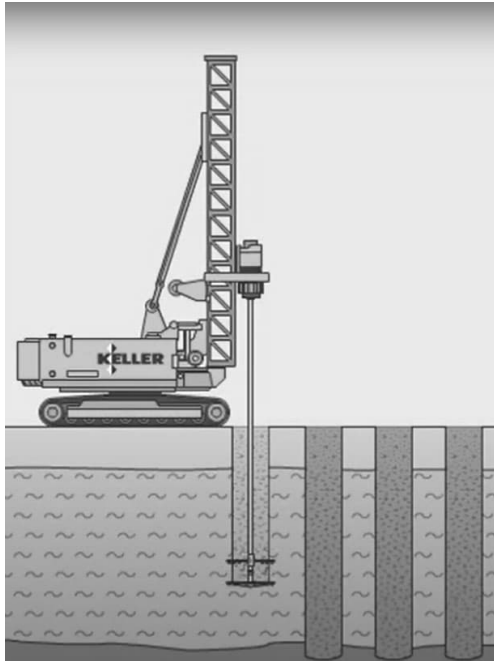
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## 1§ Types of KC stabilization

There are in principal three methods for KC stabilization. They are used depending on purpose.

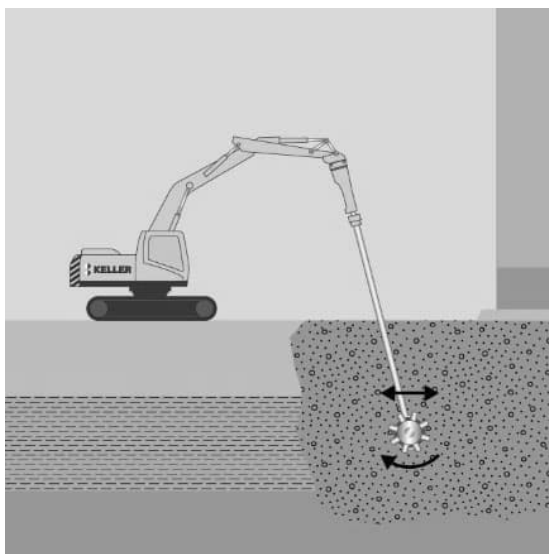
- Method 1:

Deep stabilization using vertical KC-piles (KC is generally added during moving downwards).



- Method 2:

Layer stabilization creates homogenous mass stabilization ("masstabilisiering"). Used mainly in areas where organic material (peat or mud) is less than 5 m due used equipment.



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- Method 3:

Layer stabilization creates homogenous foundation stabilization ("terrasstabilisering").

Existing weak material can be strengthened by mixing KC with layers of 0.4 m. Probably not so useful when existing material contains larger stones.



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## 2§ Use of KC stabilization in Sweden

There are in principal three methods for KC stabilization. They are used depending on purpose.

- Method 1:

Deep stabilization using vertical KC-piles are commonly used in road works where there is peat, clay or mud.

- Method 2:

Layer stabilization creates homogenous mass stabilization. Used in with wet organic material. In Sweden mostly used in areas near coast line.

- Method 3:

Layer stabilization creates homogenous mass stabilization is not common in Sweden yet.

Possible explanation to this is that good gravel for roads works has previously been found in abundance. The CO2 effect of replacing weak material has never been an issue.

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### 3§ General advantageous of KC stabilization

The advantageous for road band using various methods are seen below.

#### Method 1:

Deep stabilization using vertical KC-piles are commonly used in road works where there is peat, clay or mud.

- Effect in ultimate state → vertical resistance is increased.
- Effect in service state → settlements are reduced.
- Existing weak material → can be kept.

#### Methods 2 & 3:

Layer stabilization is not a method for deep stabilization unless several layers are installed.

Using method 2 "masstabilisering" results in layer thickness 5 m

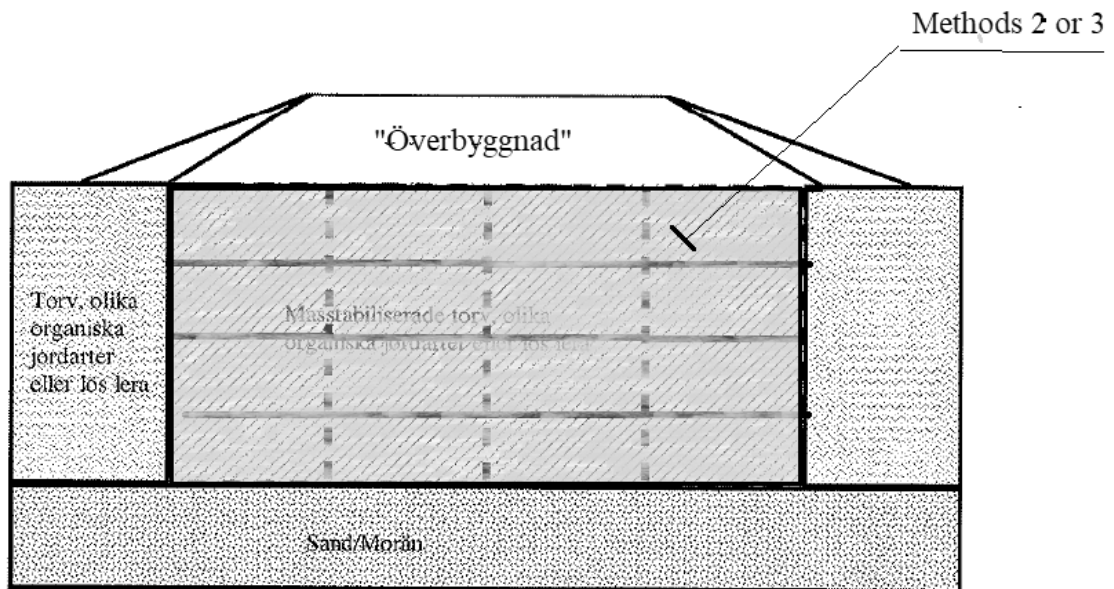
Using method 3 "terrasstabilisering" results in layer thickness 0.5 m

- Effect in ultimate state → vertical resistance only increases if all weak material is stabilized
- Effect in service state → settlement are only reduced if all weak material is stabilized
- Existing weak material → can be kept
- Effect on frost heave ("tjälskjutning") → no risk of frost heave
- Effect on "överbyggnad" → can be made with reduced thickness & easier to compact road material
- Effect on road construction during winter → road construction can be performed during winter

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## 4§ Thick layers of weak material

In areas of thick weak material ( > 3 m ) method 3 may not be feasible.



A possible solution in these areas are to combine methods 1 & 3 as seen in sketch below.

