



# 29. JAHRESTAGUNG 29<sup>TH</sup> ANNUAL CONGRESS



## Topic Soil investigations

### Disclaimer

This is a summary of the of the comments are made by the DCA-Members to this item in the workshop. Some of the comments are contradicting each other. These do not necessarily represent the opinion or standpoint of the DCA as an organisation.

The DCA will use this information in the next revision of the technical guidelines as the association feel appropriate.

### Topic

### Response

Who is responsible for the soil investigations? Once surveys result available, who is responsible for the ground conditions encountered?

- This varies from country to country in accordance with local rules around ground risk. DCA guidelines presumably based around German ground risk best practices, which are not always applicable in third party countries.
- When ground conditions in the field differ from result of soil investigation, report to your client immediately;
- Address the shortcomings of the ground investigation;
- Discuss solution to tackle the difference in soil conditions with client;
- Find agreement who pays for extra costs of follow-up investigations;
- No clear regulations for this case
- First report to client when ground conditions differ from investigation results;
- Debates about ground conditions are very time consuming, sometimes longer than actual construction;
- Do not stop working – find a solution
- Report to client immediately;
- Check recorded bored data for clues;
- Follow up ground investigation;
- Find agreement between contractor and client;
- Some large clients use their position to lay of negotiations about differing geological conditions until contractor gives in.
- Establish price position in bidding offer for unplanned works
- Different understanding of contractual interpretation or valuation of the SI; in case of deviations, it is often not easy to come to an agreement between client and contractor, but generally, it is considered to be better, otherwise the only ones making money are the lawyers
- The contractor is not always in the position to demand a decent SI; there is often competition accepting the absence of an SI
- Due to the demand on the cable projects, one participant is of the opinion that the quality of SI has improved.

Are the guidelines recommendation on soil investigation appropriate to both large- and small-scale drillings?

- The guidelines in its current form are comprehensive enough to cover all sizes of HDD projects. The guidelines constitute a basis for client discussions.
- Generally, the guidelines work well and they provide good guiding principles.
- The guidelines are helpful in debates and offer good arguments
- The categories in the DCA-guidelines do not work for HDD-projects, a better gradation is needed.
- Maybe back to 3 categories;
- Almost no information is needed for category 1 – not good;
- There are inconsistencies between table 13 and the other tables in chapter 2

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	<ul style="list-style-type: none"><li>• DCA Guidelines mandatory for high voltage projects in Germany;</li><li>• Too extensive, too bureaucratic</li><li>• Some inexperienced planners take guidelines as a strict law without thinking about their purpose;</li><li>• Better gradation to project size would be helpful</li><li>• The suggested spacings for investigation drillholes are often taken as a strict law without applying good engineering judgement.</li><li>• It would be better to set up an exploration program that is based on the topographic and geological setting of the HDD-site.</li><li>• Discussion how the DCA-Guidelines should be seen – as strict guidelines or as general suggestions;</li><li>• The DCA-guidelines should not be used without a basic knowledge of HDD.</li><li>• Maybe an HDD-Textbook for instructional purposes would be helpful.</li><li>• For small scale drilling, often no investigation done; risk is with the contractor, in case of deviation of the expected formation, burden of proof also with contractor, leading to open ended discussions</li><li>• For large scale drilling, normally detailed investigations (quality thereof was not discussed....)</li><li>• The categories in the DCA-guidelines do not work for HDD-projects, a better gradation is needed.</li><li>• Maybe back to 3 categories;</li><li>• Almost no information is needed for category 1 – not good;</li><li>• There are inconsistencies between table 13 and the other tables in chapter 2</li><li>• Small scale drilling is provided with less information than before. Since these are often working in an area where they have worked before, they base their offers on existing knowledge from the area. Ideally, these assumptions are described in the offer, so at least there is a basis for discussions, if necessary.</li><li>• Payment is often based on their assumption of different classes of formation drilled, as described in their offer</li><li>• The (German) participants on the table using small scale drilling are using the obsolete soil classification system and are using drilling times to prove in which soil type they are. This is based on trust between client and contractor, as it is very difficult to document this reliably</li><li>• The SI required for category 1 is considered to be not enough.</li></ul>
DCA guidelines recommendations and benchmark of requirements in other codes/countries – have you experienced differences in practices from region/client/market/country?	<ul style="list-style-type: none"><li>• Huge variation in reporting standard seen in different countries and regions. Industry practices in different jurisdictions creates contrasting rules around whom carries ground risk.</li><li>• Economics / contracts may dictate extent of geotechnical investigations</li></ul>
Quality of the reports – sometimes they are too dense, and key information is not accessible. Shall we request an easy reading summary (example - traffic lights?)	<ul style="list-style-type: none"><li>• Consensus was that a summary highlighting major hazards and pertinent geological and geotechnical would be beneficial.</li><li>• In the absence of a summary. Stakeholders could use AI, as a means to gain best and an alternative worst case scenario from the text.</li><li>• Traffic lights would be a good idea;</li><li>• Traffic lights can mislead the reader, because they may leave out important information;</li><li>• A bullet-point summary is seen critical, because it may lack important information and well trained engineers should be able to extract the information they need even from a long text</li><li>• A summary for the HDD-specific aspects would be helpful.</li><li>• Traffic lights difficult to define, probably not a good idea;</li><li>• A short summary with the key points of the geotechnical report would be good.</li></ul>

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How to approach a project when there is not a lot of geotechnical information available? Shall DCA suggest a Checklist, or which are the priorities in your point of view?	<ul style="list-style-type: none"><li>• Varying opinions.<ul style="list-style-type: none"><li>○ Experienced Maxi Contractors with sufficient internal resources working in known area, seemingly content to build ground risk into price.</li><li>○ Other Maxi – Requesting detailed reports and have a priority checklist (backed up in DCA guidelines) that can be presented to clients</li></ul></li><li>• Desktop study</li><li>• Offset data provided by client</li><li>• Geological &amp; Drift Maps</li><li>• Research historical information.</li><li>• Site visit to test potential outcrops, carry out basic field test.</li><li>• Checklist would be good;</li><li>• Information loss between contractors and subcontractors</li><li>• Contact Local geologist</li><li>• Ask well drillers about their experiences in the region of the HDD-site;</li><li>• A checklist would be very good;</li><li>• Check geological maps,</li><li>• Information loss between contractors and subcontractors</li><li>• Suggestion was made to create a sort of geological library for HDD ´s. This led to the discussion if providing information to the competition is beneficial if similar info can be gained from others</li><li>• Apparently Tracto is supplying soil investigations to clients as part of the tender info. (Note from Tracto after the workshops: Upon request of certain clients, they are preparing a first desk top study, based on geological maps. This is meant as a starting point for further investigations, or in some cases (easy and known circumstances confirmed the tender)</li><li>• Some clients order engineering companies to provide a (first) soil information document, based on public information</li><li>• Certain clients are apparently asking engineering companies to make a desktop study, based on publicly available documents</li></ul>
Which is the minimum amount of information? What to do if there is no or too few information about the soil conditions.	<p>(Note, varies per region !)</p> <ul style="list-style-type: none"><li>○ Soils:<ul style="list-style-type: none"><li>○ CPT / Grainsize distribution.</li></ul></li><li>• Rock: -<ul style="list-style-type: none"><li>○ UCS/ Cerchar Abrasivity</li><li>○ RQD</li><li>○ Main lithological units</li></ul></li><li>• Applicable to both:<ul style="list-style-type: none"><li>○ groundwater and salinity</li><li>○ Description of soil and rock</li></ul></li></ul> <p>Grain size distribution Abrasiveity Plasticity UCS Specific gravity</p>

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	<p>Density Degree of weathering Permeability Mud losses Water influx Swelling properties Separation between layers</p> <p>Consideration should be given to:</p> <ul style="list-style-type: none"><li>• Ultimately Initial HDD Risk Assessment should drive required geological/geotechnical</li><li>• Utility plans</li><li>• Maps and plans of borepath;</li><li>• Combination of geological information with geophysical results if available;</li><li>• Exploration drill holes must be deeper than bore path;</li><li>• Ground water information;</li><li>• UXOs;</li><li>• Existing utilities</li><li>• Longitudinal sections with ground conditions;</li><li>• Unit weight, density of soil;</li><li>• Information on reactivity of clays</li><li>• Cobbles and boulders</li><li>• Salinity of groundwater</li></ul> <p>The SI requirements for category 1 are considered to be not enough.</p>
Can we trust known experiences: I have drilled here before, I know what I can expect...	Experienced Contractor working in a known area and having local “tribal” knowledge maybe content to work with minimal information.
Is it pertinent to add to the guidelines recommendations for other surveys (environmental, utilities, metocean, faults, drainage etc)	Defining extent of a fault zone.
Notes that do not fit to the questions	<ul style="list-style-type: none"><li>• Addition of supporting tables and / or graphs in Appendix. Pertaining to Geotechnical parameters.</li><li>• Drilling Rate Index value</li><li>• (DRI) Mentioned in the guidelines but either not known or not well understood.</li><li>• A supporting Paragraph around this value would be beneficial.</li><li>• The risks of an HDD-project must be known to everybody;</li><li>• Geophysical investigations are hard to interpret, but very helpful when you have someone to interpret them.</li><li>• Never place exploration boreholes directly on your HDD-drill-path – big risk of blowout</li></ul> <p>Chapter 10 of the guidelines does not match the recommendations in Technical Information No.1 - Quality Assurance</p>

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	<p>The new revision should incorporate a catalogue, that must be completed by the soil investigation company. This should not only include lab results, but also a comprehensive conclusion and opinion on relevant items with an effect on the feasibility. Important questions should only be possible to answer yes or no.</p> <p>The human factor is, despite all technical support, still decisive. The lack of good personnel is the cause for many problems, especially in the current boom</p>
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