DCA Tecnical Information No. 5

DCA Technical Guidelines

Information and Recommendations
for the Planning, Construction and Documentation of HDD Projects

4th Edition - 2015
Amendment - 2019
Chapter 4.4.1 Tolerances New Version

Impress

Information according §5 TMG:

Drilling Constractors Association (DCA)
Charlottenburger Allee 39
52068 Aachen
Germany

Authorised to represent executive board:
1. President: Jorn Stoelinga
2. Vice-President: Marco Reinhard
Treaurer: Jürgen Muhl

Contact:
Phone: +49 (0) 241 9019290
Fax: +49 (0) 241 9019299
E-Mail: dca@dca-europe.org

Registration information:
Recorded in the register of associations.
Register Court: Amtsgericht Mönchengladbach
Company registration number: 18VR1860

Accountable for the content according to § 55 Abs. 2 RStV:
Dipl.-Geol. Dietmar Quante
Fabian Quante
Charlottenburger Allee 39
52068 Aachen

Einleitung

With publication of the German VOB DIN 18324 tolerances for the execution of horizontal directional drillings were initially introduced and in the same manner subsequently adopted in the 4th revision of the DCA Guidelines.

These tolerances define the permissible deviations between the works and their respective specification in terms of contractually agreed dimensional properties. Beyond that, the publication of tolerances serves all parties as guidance for HDD specific deviations that may generally be expected.

In practice however, the introduction of general tolerances led to multiple and prolonged discussions especially with regard to the specified accuracy of bending radii for pipes or drillings.

Especially for large diameter drillings and in difficult or changing geologies, it was often not possible to meet these requirements. The discussions were aggravated by misunderstanding and differing opinions among the parties as to the definition of specifications or tolerances – this especially, due to ambiguous requirements in VOB DIN 18324 (geometry of the pipe) and DCA Guidelines (geometry of the pilot drilling).

In order to prevent future discussions and contradicting requirements with regard to VOB DIN 18324 the draft revision of the Adjustment of the "Tolerances" passage has been developed by a DCA work group.

It should be noted, that the specified tolerances apply as a general rule for the execution of HDDs. Deviating requirements shall be agreed by the parties with due justification, if it may be expected in any special case that the general requirements will not be met.

Rock or soils with heterogeneous properties as well as significant changes in compaction may in certain cases affect steering of the drilling considerably. Corresponding measures or agreements shall be in place prior to contract signing or commencement of the works, since such (geotechnical) information is generally available during the planning phase.

The same applies for individual cases, if e.g. the dimensions or sequence of drilling tools and guidance systems are likely to affect the steering.

An assessment of such effects as well as the choice of corresponding design radii shall be carried out with due regard of the relation between steering angles and radii. The following figure illustrates the influence of a constant angular error at differing radii.

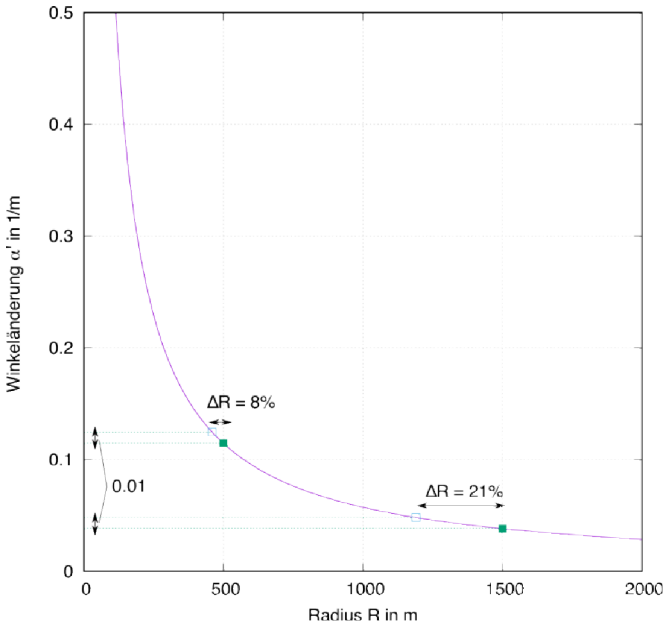

Fig. 1: Influence of a constant angular error at differing radii

The upper bound of the permissible deviation from a specified radius has correspondingly been deleted as an important change of this revision of the DCA guidelines – and in contrast to VOB DIN 18324 – since a reduced curvature of pipes is in general not considered a limitation to the works. The permissible positional tolerances (horizontal, vertical) remain unaffected by this change.

Aachen, June 2019
Drilling Constructors Association (DCA-Europe)

4 Project planning

4.1 Fundamentals

4.1.4 Tolerances (New Version)

In general, the following tolerances apply to horizontal directional drillings:

- The axis of the installed pipe may deviate vertically and laterally from the specified alignment to a maximum of 10% of the maximum depth except for entry- and exit point locations. Reference for determining the maximum depth is the straight connection between entry and exit point.
- The radius of the installed pipeline may not underrun the specified radius demanded by the client by more than 10%.
- Deviation of the pipe axis at the entry point may equal the pipe's diameter but must not be greater than 0.3 m
- Deviation of the pipe axis at the exit point may equal 2% of the drilling length but must not be greater than 5.0 m

If required, verification of the tolerances shall generally be based on an as-built survey of the pipe axis. Alternatively, the pilot survey data may serve as an indication. The uncertainties of the applied survey and calculation method are to be accounted for and suitable intervals shall be used for the calculation of an average radius. A length of 30 m is recommended.

Deviating requirements are to be agreed upon between client and contractor prior to contract award in a written manner. Most importantly these are:

- deviating tolerances or acceptance criteria,
- definition of specified nominal dimensions, if these are not detailed,
- assessment of the pipe axis based on pilot hole data with specification of the appointed calculation algorithm

The client shall be informed without undue delay while stating comprehensible causes, if it becomes apparent prior to start or during the execution of the drilling works, that the required tolerances are not to be met.

Verband Güteschutz Horizontalbohrungen e. V.
Drilling Contractors Association (DCA)
Association des Entrepreneurs de Forage Dirigé
Charlottenburger Allee 39
52068 Aachen
Tel.: +49 241 90 19 290
Fax: +49 241 90 19 299
E-Mail: dca@dca-europe.org
Internet: http://www.dca-europe.org