

Experiences with Non-destructive Examination on Cables and their Terminations in Civil Engineering Structures

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Abstract. Bridge cables and guy cables are used as high-strength tension members in civil engineering. Depending on the design of the bridge structure the cables may be either carrying cables or cables for suspension - or cable stayed bridges. Guy cables are also used in radio towers, steel chimney stacks, roof systems and similar structures.

Usually their life expectancy is endangered by static load, pulsating tensile stress and corrosion.

There are no generally valid calculation methods, or at most only inadequate ones, by which the aforementioned three critical variables can be determined.

Damages like wire breaks and corrosion on the free length of the cables will be detected principal by means of a magneto-inductive testing method.

Damages frequently occur to high-strength tension members in areas which are not freely accessible, for example in the transition between the cable or wire bundle and the sockets, below a mounted clamp or a deflection saddle. For examinations in these zones an ultrasonic (UT) method has been found to be appropriate. With this it is possible to detect even small items of damage, such as cracks in wires, complete wire breaks and heavy corrosion scars.

This paper describes the usage of the magneto-inductive and ultrasonic technique for the examination of cables and their terminations built in bridges and cable stayed constructions with some examples.