

Deflected mode of junction of pipes of different diameters in the constructions of contact-line supports of electrical transport

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Abstract

© Research India Publications 2015. Rapid pace of development of energy, communications, telecommunications and other industries of economy stimulate fabrication of structural steel with application of tubular rods (round pipe, polyhedral bent studding, profile of closed section and so on), processing a number of constructional qualities which provide decline in demand for steel, decrease intensity of wind loading, increase corrosion resistance [1-3]. Such constructions can be referred to the transmission towers, supports for wind-generated installations, towers of cellular communications, supports of urban illumination, supports of contact-line networks of electrical transport, supports for advertizing structures, supports for lighting (traffic signal installations) and the others. In designing constructions from the pipes one of the most important tasks is support of bearing capacity of node points of junction. It is substantiated by experimental data indicating that in many cases a carrying capacity of the whole construction is determined by the strength of junction bond of its elements. The designs from pipes are performed from separate shafts or in the form of flat, or space grid systems. Urge towards decline in demand for steel in these constructions leads naturally to the use of tubular rods of different diameter. On the whole, the effectiveness of tubular constructions is determined to large extent by constructive design of node points of connection of tubular rods. In practical building it is applied different types junction of tube bars, including assemblies from pipes of various diameter. It has been first developed numerical methods of analysis of determination of deflected mode of the pipes of different diameters by push fit of one into the other. For ECM, using the language FORTRAN it had been coded «AutoRSS. 01», which allows to DM components of telescopic joint of pipes being different in diameter. It has been carried out comparative assessment of the results of calculation of DM joint units according to the suggested program «AutoRSS. 01» the known programs, realizing the method of finite-elements method (FEM). It has been performed the analysis of the results of calculation according to the suggested program «AutoRSS. 01» and determined an optimal push of one pipe into the other, which is within the limits of $2 \div 2.3d$, where d -diameter of smaller pipe.

Keywords

Deflected mode of pipe junction, Electrical transport contact-line support, Illumination supports, Power plant construction