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BIM-CON-BIM based construction with RFID-Technology

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Since approximately 2005, the Chair of Construction Management & Economics of the Bergische University of Wuppertal deals with the application of modern technologies and methods, finite element the RFID technology in connection with the method of the Building Information Modeling. In this connection, a comprehensive draft with the aim of the digitization of the supply chain was developed within the scope of a huge number of research projects. On this occasion, the data delivered from the planning process are complemented with the real data grasped by the AutoID technology, as finite element logistics and implementation or decrease data during the execution of construction, servicing and rebuilding data during the building use up to building back construction. These data are linked with the building data models by means of the method BIM (Building Information Modeling). The results of the research and the added value for everybody in the construction sector are united within a demonstration module and a video. For two years this demonstration module was presented to the public in Germany to provide the suitable knowledge in the construction sector for all partners. These projects and the demonstration module should be discussed in the contribution paper which is meant as an introduction to an exemplary application which has found its relation to practice. In the practical example, a company in Germany reorganised its whole contractor's yard. The system is used according to demand as a rent station, material shop, spare parts store, key and document management or as a meeting demand order system.

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Vulnerability of steel towers of wind turbines considering damage caused by fatigue

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An approach is proposed to evaluate the reliability over time of steel tubular towers of wind turbines, taking into account the structural damage accumulation caused by fatigue at the base of the tower. This is an important issue because in some cases fatigue could govern the design of steel towers. The general steps of the approach are: 1) Simulate a turbulent wind field for different mean wind speeds (in our case these are between 1 m/s and 30 m/s); 2) Calculate force time histories of turbulent wind and apply them along the height of the steel tower; 3) Perform "step by step" time analyses, and obtain the stress time histories at the base of the structure; then, obtain the effective stress information corresponding to each mean velocity. Steps 1, 2 and 3 are repeated for different mean velocities; 4) Using the Monte Carlo technique, simulate the service life of the wind turbine and obtain the statistical characteristics of the crack growth due to fatigue at the base of the tubular structure; 5) Obtain fragility curves of the steel tower for different time intervals (20, 30 and 70 years). The steel tower of the horizontal wind turbine analyzed is located in a windy zone, in the state of Oaxaca, Mexico.

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