

ANALYSIS OF BUILDING DEFECTS AND STRUCTURAL FAILURES IN CIVIL LAW-SUITES

RESEARCH GROUP: Tomaso Trombetti

KEYWORDS: forensic engineering, building defects, structural failures, statistical analysis, web-based portal

Forensic engineering

Forensic engineering is “*the application of the art and science of engineering in matters which are in, or may possibly relate to, the jurisprudence system, inclusive of alternative dispute resolution*” (National Academy of Forensic Engineers, NAFE). Forensic engineers investigate and reconstruct the mechanisms behind failures in a variety of systems, often determining the cause and liability of an event as it moves towards, or into, a courtroom setting.

Observatory “Claudio Ceccoli”

A research centre entitled Observatory “Claudio Ceccoli” was established in January 2012 within the Department of Civil, Environmental and Materials Engineering (DICAM, 2014) of the School of Engineering and Architecture at the University of Bologna. It represents one of the few Italian research centres that is entirely devoted to issues related to forensic engineering. The centre has a multidisciplinary nature, as it involves the collaboration of different categories such as academia researchers, professional engineers, architects, lawyers and various companies (e.g. construction firms, insurance companies). In particular, a close relationship has been established with the Court of Bologna through a specific research agreement that is based on the joint evaluation of a huge amount of real cases. The members of the Observatory have free access to the archives of the Court, which provides the documentation related to past and present technical advices. The documents can be consulted and then analyzed by the DICAM researchers enrolled in the Observatory. The first activities of the centre, which were conducted over the first year (2012), were mainly focused on the close examination of past real cases (up to 2011), as provided by the Court of Bologna, in order to identify: (a) typical causes; (b) similarities among the analyzed cases; (c) eventual deficiencies.

The activities of the Observatory are:

- a continuous analysis of the data collected in the web-based database;
- the institution of periodic ‘focus’ to answer specific questions that arise from the analyses of the examined cases;
- the divulgation of statistics as extrapolated from the analyses of the examined cases;
- the development of guidelines for technical consultants dealing with the typical enquiry of the judge, the ethical profile of the consultant and the typical structure of technical advice;
- the development of a specifically devoted website.

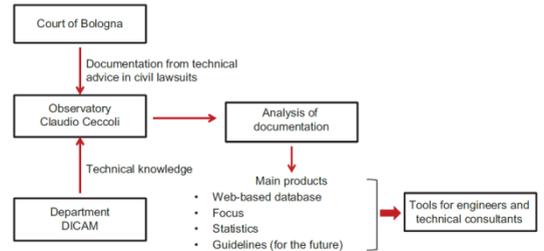


Fig. 1. Flow chart of the main interactions and activities between the Court of Bologna, the DICAM and the Observatory “Claudio Ceccoli” (Trombetti).

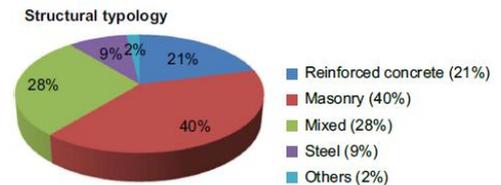


Fig. 2. Example of statistics related to the analyzed cases (Trombetti).

“ÆdiLex” project

The “ÆdiLex” project aspires to enhance the telematics process (PCT), embarked by the Justice Minister in the 2012, by pulling the scientific and technological contents out from technical advices of the civil litigation regarding

building. The PCT represents a great opportunity to apply, at a national level, the computerized methodologies developed by the Observatory "Claudio Ceccoli". This initiative, unique in the world, could be able to improve the entire construction process, to reduce mistakes and to increase buildings and environmental safety.

Object of the present project is the creation of an informative system for all the actors, independently from their roles, involved in the building processes. The project foresees:

- Development of a specific integrated informatics portal – open access to acquire process and publicize the data and the analysis of the technical advice. The management of the portal is entrusted to a control organs (Supervisor);
- Elaboration and validation of the data through the activity of the "Osservatorio Ceccoli" than the dissemination of the acquired knowledge on the portal.

MAIN PUBLICATIONS

Trombetti, T., Tattara, S., Palermo, M., Gasparini, G., Silvestri, S., & Pieraccini, L. (2014, September). The first year of activities of the "Observatory Claudio Ceccoli", on the defects of the building structures. In IABSE Symposium Report (Vol. 102, No. 25, pp. 1024-1030). International Association for Bridge and Structural Engineering.

Trombetti, T., Tattara, S., Palermo, M., Gasparini, G., Silvestri, S., & Pieraccini, L. (2015). Italy's new forensic engineering research centre: a progress report. Proceedings of the Institution of Civil Engineers-Forensic Engineering, 168(1), 17-24. S. Ivorra, B. Ferrer, D. Foti, L. Stempniewski, T. Trombetti, S. Silvestri, G. Gasparini, I. Ricci, A. Catalini, C.M. Campian, D. Malavolta, Final Report - *SE. SI. CO. WA. Project*, December 2012.

Trombetti T., Pieraccini L., Sapio R.: Il grave difetto. Proceedings of IF CRASC'15 Convegno di Ingegneria Forense, V Convegno sui Crolli, Affidabilità Strutturale, Consolidamento, Roma, Italia, 2015.

Trombetti T., Pieraccini L., Sapio R.: Il normale comportamento. Proceedings of IF CRASC'15 Convegno di Ingegneria Forense, V Convegno sui Crolli, Affidabilità Strutturale, Consolidamento, Roma, Italia, 2015.

Trombetti T., Sapio R., Pieraccini L.: I difetti del costruito: analisi statistiche sul territorio di Bologna. Proceedings of IF CRASC'15 Convegno di Ingegneria Forense, V Convegno sui Crolli, Affidabilità Strutturale, Consolidamento, Roma, Italia, 2015.

Trombetti T., Sapio R., Pieraccini L.: Le pavimentazioni industriali in c.a. Proceedings of IF CRASC'15 Convegno di Ingegneria Forense, V Convegno sui Crolli, Affidabilità Strutturale, Consolidamento, Roma, Italia, 2015.

RESEARCH PROJECTS

Convenzione Tribunale di Bologna – DICAM. Responsabile scientifico: Prof. Tomaso Trombetti.

Convenzione MINISTERO DELLA GIUSTIZIA - Dipartimento dell'organizzazione giudiziaria, del personale e dei servizi - Direzione Generale per i Sistemi Informativi Automatizzati (D.G.S.I.A.) – DICAM. Responsabile scientifico: Prof. Tomaso Trombetti.

LINKS AND CONTACTS

tomaso.trombetti@unibo.it