Conservation of 20th Century Concrete Heritage Structures in Cyprus: Research and Practice

Antroula V. Georgiou*, Maria M. Hadjimichael and Ioannis Ioannou

Department of Civil and Environmental Engineering
University of Cyprus
1 Panepistimiou Avenue. 2109 Aglantzia, Nicosia. P.O. Box 20537, 1678 Nicosia, Cyprus
e-mail: ageorg44@ucy.ac.cy; hadjimichael.m.maria@ucy.ac.cy; ioannis@ucy.ac.cy

ABSTRACT

The conservation of 20th century concrete heritage structures poses a major challenge worldwide. Whilst these structures possess a remarkable architectural value and a rather experimental character in terms of the use of materials and technologies, at the same time there is admittedly lack of recognition of their cultural and historical value by the wide public. More often than not, such buildings are left to deteriorate and often they are even demolished.

This paper follows the workings of the project "CONSErvation of 20th century concrete Cultural Heritage in urban changing environments" (CONSECH20) on the island of Cyprus. This international interdisciplinary project aims to investigate concrete constructions built until 1965 in four different European countries (Cyprus, Italy, The Netherlands and the Czech Republic), in terms of their architectural, social and historical value, and to address their restoration and re-use potential.

The paper initially presents the significance of 20th century concrete heritage structures in general, and explains the criteria adopted for the selection of representative case studies in CONSECH20 (in line with their architectural, social and historical importance). It then describes the methodology proposed in order to ensure the protection of such buildings from demolition, and facilitate their restoration and re-use (if and where possible) for the benefit of the society. The focus is on the structural assessment and restoration of 20th century concrete heritage buildings, following the methodologies described by modern codes for the assessment and retrofit of existing concrete structures. A new practical analysis approach is described and compared to the force-control approach of the pushover analysis of Eurocode 8:3 [1], which significantly overestimates the demands for seismic upgrading. The two aforementioned approaches are examined for a specific case study concrete heritage building in Nicosia, Cyprus.

REFERENCES

[1] Eurocode 8. Design of structures for earthquake resistance—Part 3: Assessment and retrofitting of buildings. Brussels: CEN/CENELEC Internal Regulations, 2000.