EXPERIMENTAL STUDY FOR DETERMINATION OF THE FRACTURE MECHANICS PARAMETERS AT WELDED STEEL BRIDGES IN USE

Anca Gido[1]

[1]University "Politehnica" of Timisoara-Romania, Department of Steel Structures and Structural Mechanics

Corresponding author: Anca Gido, anca.gido@ct.upt.ro

Abstract: The aim of the experimental program within the work for the elaboration of the PhD thesis is the study of the behavior of welded I-girders, typical for the stringer of steel bridges, under dynamic loads.
In current practice it is thought, that when cracks appear, the steel structure is not safe to use anymore. The consequences of this fact are the closing of the circulation, costly rehabilitation works and sometimes the replacement of the whole building. All this things can be avoided by a detailed verification of the fatigue respectively through determination of the remaining service life based on the existing cracks.
For this purpose a girder was fatigued under cyclic loading, until a fatigue value equal to 0.8 according to the Palmgren Miner Rule was reached. From this girder and from an unfatigued sample of the same material 18 samples were taken and prepared according to ASTM E 647–93. The tests for establishing the m and C parameters of the Paris equation were performed in the Laboratory of the Technical University of Munich, Germany, in normal laboratory conditions.
The conclusions of the study will be presented in the paper.
Key words: Maintenance, reliability, life cycle, time and cost