

# EXPERIMENTAL INVESTIGATION INTO RESIDUAL STRESSES OF WELDED H-SECTIONS MADE OF Q690 STEEL MATERIALS

**Xiao Liu and Kwok-Fai Chung**

*Department of Civil and Environmental Engineering,  
The Hong Kong Polytechnic University, Hong Kong SAR, China*

## ABSTRACT

In order to exploit full structural benefits offered by high strength steel materials, it is important to establish qualified welding procedures for fabrication of welded sections made of Q690 steel materials as well as to quantify welding effects on these steel materials for structural design. By careful selection of welding wires and proper control of welding parameters as well as electricity supply, an experimental investigation on welded H-sections made of Q690-QT steel plates have been conducted. Residual stresses of a total of four welded H-sections have been measured through the use of the hole-drilling method according to ASTM E837. This paper describes key findings of the experimental investigation, and comparison on residual stress patterns of welded H-sections made of steel plates with different steel grades is also presented.

**Keywords:** High strength steel, Welded H-sections, Temperature measurements, Residual stress distributions, Hole-drilling method.