

STRUCTURAL RESPONSES OF HIGH STRENGTH S690 WELDED SECTIONS UNDER DIFFERENT CYCLIC ACTIONS

Y.B. GUO¹, H.C. HO^{1,2}, M. XIAO^{1,2}, X. LIU^{1,2}, and K.F. CHUNG^{1,2,*}

¹ Department of Civil and Environmental Engineering,

The Hong Kong Polytechnic University, Hong Kong SAR, PR China

² Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch),
The Hong Kong Polytechnic University, Hong Kong SAR, PR China

E-mails: liz.guo@connect.polyu.hk, meng.ce.xiao@connect.polyu.hk, leo-xiao.liu@connect.polyu.hk,
hc.ho@polyu.edu.hk, kwok-fai.chung@polyu.edu.hk

*Corresponding author

Abstract. *Structural engineers are constantly looking for high strength constructional materials as they face huge challenges in providing structural solutions to build heavily loaded structures, such as high-rise buildings and long span bridges. Applications of high strength S690 steels to building structures are very attractive owing to their high strength to self-weight ratios which often provide significant savings in costs and time. However, there are concerns on mechanical properties of welded S690 members, in particular, in both strength and ductility, and there is a lack of technical guidance on how to assess any adverse effect on these mechanical properties. This paper presents an experimental investigation into structural responses of S690 steel plates and welded sections under cyclic actions with both constant and varying strain amplitudes, and comparison on cyclic deformation characteristics of both steel plates and their welded sections is presented.*

Keywords: *High strength steel; Welded sections; Cyclic tests; Hysteretic behaviour; Ductility.*