Monitoring in combination with proof- and high magnitude load testing can evaluate potentially higher load carrying capacities in existing bridges. However, such in-situ testing provides challenges like limited test-time, difficult calibration under in-situ conditions etc. Consequently, in-situ load-testing significantly amplifies the requirements to monitoring. This paper focuses on results from in-situ DIC-monitoring. The method was used to evaluate deformations- and crack initiation on large concrete bridge surfaces during high magnitude load-testing. DIC-measurements are very susceptible to light, surface texture and contrast, etc. Laboratory testing and preliminary site inspections were done to investigate the measurement conditions. Monitoring was executed with conventional- and wide-angle lens DSLR-cameras positioned underneath the bridge, measuring vertically to the surface. The 2D output from the DIC-software was corrected for wide-angle lens distortions and out-of-plane deflections. The method seems desirable for a more generic use, and has potential for the evaluation of stop criteria.