

Development of a movable T-ray A-scanner for tendon inspection

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When manufacturing bridge tendons, air gaps may be formed between the sheath and the grout. The T-ray technology can be considered as a promising way for nondestructive inspection of bridge tendons to detect the existence and size of the air gaps. For the purpose, we have developed a movable T-ray A-scanner that can be used to measure T-ray A-scan data in real time. The T-ray A-scanner consists of the portable T-ray probe and the movable T-ray controller, which are connected to each other by the hose containing electric and optical cables. A T-ray A-scan data can be measured every second with the T-ray A-scanner. We have manufactured a tendon specimen to test the performance of the T-ray A-scanner. Two or three peaks are shown in the T-ray A-scan data measured from the tendon specimen. The first and second peaks come from the surface of the sheath and the interface between the sheath and the grout, respectively. In the case of the existence of an air gap between the sheath and the grout, the second peak comes from the interface between the sheath and the air gap. Air gaps beneath the sheath can be clearly detected due to the pronounced amplitude difference of the second peak between the two cases. The air gap size can be also measured in the case that the third peak coming from the interface between the air gap and the grout is shown.