

RESEASRCH ON IMPROVEMENT OF FATIGUE DURABILITY FOR EXISTING ORTHOTROPIC STEEL DECKS

Abstract : Fatigue cracks have been reported on several welded connection details of existing orthotropic steel decks which are vulnerable to fatigue damages due to rapid increase of traffic volume. In this research, causes of fatigue cracks and repair/reinforcing method were investigated and examined from FY2004 to 2008 in order to improve fatigue durability of orthotropic steel decks (OSD). Fatigue cracks investigated are that initiate at weld between deck plate and trough ribs, weld at top of vertical stiffeners, at butt weld of trough ribs and at intersection of trough ribs and transverse ribs. And repair/reinforcement methods examined are improvement of pavement and additional steel cross sections. Each method are studied in term of stress reduction, effects on fatigue durability, influence on neighboring structural details, fatigue durability of neighboring structures, and feasibility of application. These results are summarized in form of guidance for design and execution of the methods.

Key words : orthotropic steel decks, fatigue cracks, reinforcement, retrofit, reinforcement by steel attachment, SFRC pavement