

# Field Experiments for Clarifying the Fatigue Cracks Mechanism at the Floor Beam Ends of Yadanarbon Bridge

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## Clarifying the fatigue cracks mechanism & Proposing effective repair method

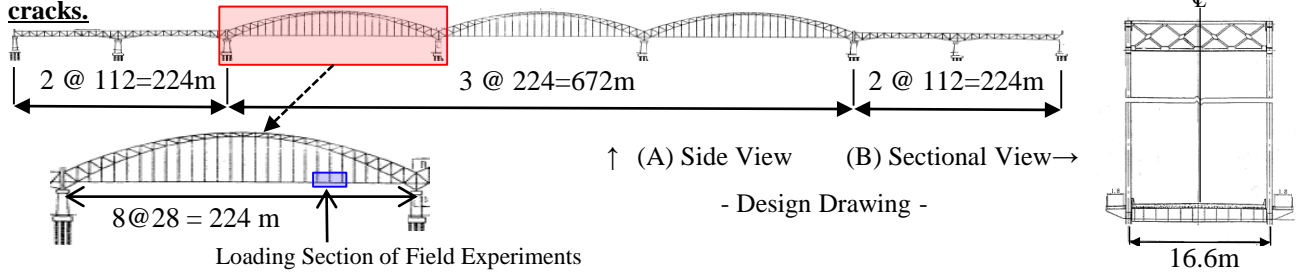
“Yadanarbon Bridge”, in the central part of Myanmar, was reported that many fatigue cracks were occurred at the welded joints between the upper flange and the web of floor beams. The bridge has a total length of 1125.8 m and consists of lower truss of the side span (224 m@2) and the lower arch of the main spans (672 m).

In this study, firstly, **the field experiment have been carried out to clarify the fatigue crack mechanism. The experiment was focused on mechanical behavior of the web gap.**

Secondly, finite element analysis is carried out in order to validate the results obtained from field loading experiments and to propose **effective repair methods for fatigue cracks.**



- Yadanarbon bridge-

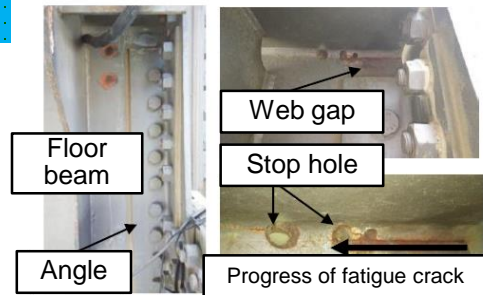


Purpose of the Study : Proposal of simple repair methods for the fatigue cracks of the bridge

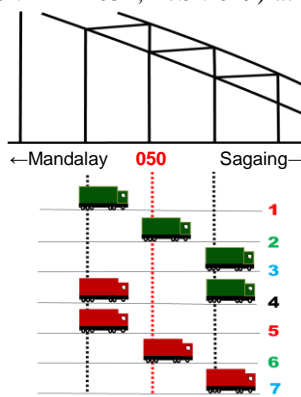
## FIELD LOADING EXPERIMENTS

The static loading experiment using two trucks was carried out as shown in below. This experiment focused on the mechanical behavior around the web gap, between the top of the angle and the upper flange. Some strain gage and displacement sensors are installed. Firstly, a loading truck is placed on the floor beam next to the target floor beam on STEP 1 (U/S : FLB-049, D/S : 051). Next, a loading truck is moved on the target floor beam (FLB- 050), and then it placed on the next floor beam (U/S : FLB- 051, D/S : 049) at the other side.

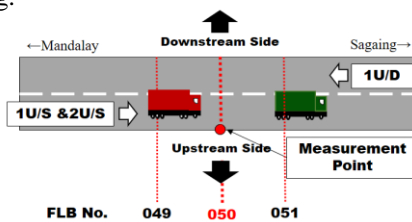
Experimental results are shown in the graphs (Vertical Displacement of floor beam ends and bending/average strain of the web gap). **It was observed that vertical displacements and bending strains of the web gap are significant large in loading STEP 1,3,5,7.** Also the vertical displacement of the symmetrical position on the web were reversed positive/negative. These results are concluded that the web gap portion is subjected to local bending.



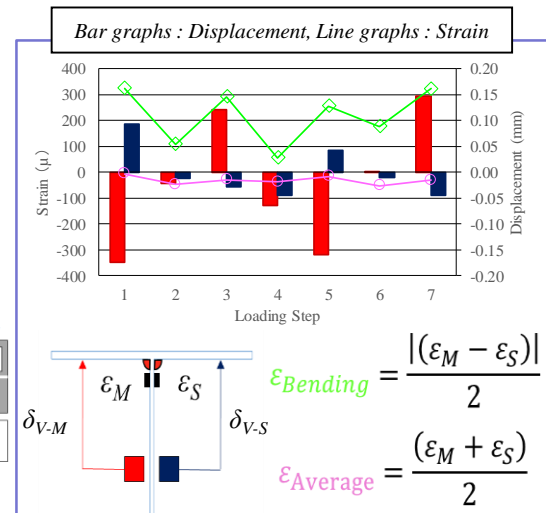
Details of the floor beam end and fatigue cracks of the web gap <sup>1)</sup>



- Loading Condition-



- Loading Position and STEPS (1 to 7) -



- Experimental Results -

### 参考文献

- 1) Kohei FUNAYAMA, Yuma SUGIMOTO, Aye Mya CHO, Takashi YAMAGUCHI, Yasuo SUZUKI, Kunitomo SUGIURA :Field Test of Yadanarbon Bridge for Clarify Fatigue Cracks Mechanism at Floor Beam Ends, ICSE, 12.2017