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■ Fatigue and Repair Cases in Steel Bridges

11 🗇 🧐

- Recent Investigations on Fatigue Problems
  - Steel Bridge Bents
  - Orthotropic Steel Deck
- Health Monitoring

Fatigue and Repair Cases in Steel Bridges Causes of Fatigue Damage

12 🕅 🧌

# Welded bridges : positively adopted since 1960

Main highways and railways in Japan Tomei, Metropolitan Exwy, Shinkansen, .....

#### Sensitive to fatigue

Fatigue damage

1960- in USA 1970- Shinkansen in Japan 1980- Highway bridges in Japan

#### Repair and retrofit

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## Identify the cause of fatigue damage

Information from experiences

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**T** 

IIW Com. XIII, WG 5 Collection of damage and repair cases Arrange these as the database on internet

#### Fatigue Cases and Retrofit Works in Steel Bridges

# Causes of fatigue damage 1.Weld-defects

- 2. Inappropriate structural details
- 3. Unforeseen stresses and displacements
- 4. Unexpected structural behavior,
- such as vibration

## Approach to repair and retrofit

Remove the causes of damage Increase fatigue resistance

Selection of repair and retrofit methods and/or replacement

Explanation of the causes of damage is indispensable

There are cases, \*immediate measure is necessary \*leave the component untouched some years

Depending on the cause of damage Aechanism of crack initiation and propagation































































6 🛡 🖲

Improve the figure (gas-cut machine-cut)

r=50















































Typical Plate Assembling Methods		
WW	WF	FW
FF	SWW	SFF
δzone		





















































































































